The Chemical Age

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Nitrogen Fixation: Through American Spectacles

THE economic symposium on nitrogen at the Swampscott meeting of the American Chemical Society was, though well attended, a relatively tame affair, devoid of discussion. The four papers presented to the meeting, and now published in full in the October issue of *Industrial and Engineering Chemistry*, merit close and careful attention, disclosing, as they do, the considered opinion of recognised authorities on the commercial development of synthetic ammonia, by-product ammonia, and the heavy chemical industries.

The immediate problems and the fertiliser future of Europe and America differ fundamentally. America is not yet "nitrogen conscious," and though capable of absorbing its present output mainly for specialised crop production, the use of fertilisers for farm products on anything approaching the European scale belongs to the somewhat remote future. Although, for instance, the value of wheat at an American farm is only about half that in Europe, and the increased use of fertiliser would only increase the available exportable surplus for disposal at lower prices, the consumption and export of nitrogen fertilisers are now definitely increasing. Long distance distribution postulates complete and concentrated fertilisers for American economic needs, and in America the cost of power rather than that of hydrogen is sometimes the more important factor in synthetic ammonia costs. The chief difficulty is probably that of manufacturing at European prices under American conditions, but there are several locations where conditions are sufficiently favourable for commercial success and expansion.

The four principal manufacturers, du Pont, Allied Chemical, American Cyanamide, and the coke oven industry, display considerable agreement in painting a gloomy picture for the future of others entering the nitrogen industry. While this may be a means of self-preservation, they differ in this respect notably from the cheerful optimism of their British and European counterparts. It seems evident that although du Pont at present consume most of their own "smoke," and the Allied Chemical in producing sodium nitrate are aiming at the Chile target, both are preparing for the time when the American fertiliser tap can be turned on. The superphosphate industry, being more localised, is in a different category, and is absorbing increasing quantities of ammonia, it having been found advantageous to incorporate about 30 lb. of ammonia per ton of superphosphate for neutralising and "upgrading" purposes. The war-time Muscle Shoals plants are regarded as impracticable as potential commercial fertiliser producers, but it is not impossible that the power resources may ultimately be utilised in part for this object.

American spectacles have a blue rather than a rose-coloured tint at present, but the opinions of the opticians responsible appear somewhat unconvincing, and it is by no means improbable that a year or two hence we may witness a very material increase in nitrogen and phosphate consumption and production, possibly accompanied by more intensified crop output from a reduced acreage.

While on the subject of chemical fertilisers, attention may be drawn to the interesting contribution of Sir Roger Onslow, published in this issue, concerning a new source of potash in Lake Chad, in Africa. Sir Roger served in Nigeria with the West African Frontier Force in 1903-4 and in 1916-17, and his interest was attracted to the native trade in potash. "Kungwa," as the Hausa natives call potash, is an important article of inter-native trade in several districts, and is sold in blocks of about 30 lb. each. Presumably, it is of a somewhat crude quality, but the important point is the extent of the natural supplies. If this is con-

siderable, the problem might be well worth investigation. Sir Roger Onslow is of opinion that large supplies of potash could be obtained from the Lake Chad district, and he estimates that transport by water to ocean steamers would not be unduly costly.

Progress in Colour Research

THE second annual report of the Research Association of British Paint, Colour and Varnish Manufacturers constitutes a remarkable record of progress, and those responsible may be congratulated on the rapidity with which the research scheme has been put in operation. The membership has increased during the year from 116 to 133, and the subscriptions, amounting to £3,562, come very close to the Government grant of £3,601. The total income is approximately £1,880 in excess of the first year's revenue, and although the Association is still working at the limit of of its income, the increase is distinctly encouraging.

The Research Station, opened at Teddington last year, has lost no time in getting to work. Considerable time has been spent upon a study of the properties of linseed oil and the processes of refining oil in general. Valuable information has been obtained as to the nature and conditions governing the stability of the mucilage found in oil. This work has resulted in a development, first of a simple, but effective, test for showing the presence or absence of mucilage in oil; and secondly, of a process of refining oil which has been protected by a provisional patent. The result of this work has been recently communicated to members, with a suggestion that those members with the technique of oil treatment on a large scale should carry the work a stage further, so that the utility or otherwise of the proposals can be demonstrated. The chief interest on the chemical side of the work has now passed to the study of the phenomena of gelation of oily products, which changes are usually, but not necessarily, unpremeditated. As a result of communications with the director (Dr. Jordan) it is clear that this general range of problems is of importance, not only to all paint and varnish manufacturers, irrespective of the special sections of the field which they cover, but also to cellulose lacquer manufacturers. In connection with the investigations concerning colour, a Colour Panel has been formed to advise on this matter, the members being Mr. J. Guild (National Physical Laboratory), Mr. R. S. Horsfall (British Dyestuffs Corporation), and Mr. Oliver Wilkins (Colour Makers' Association). An investigation into Tung Oil supplies is proceeding, and suggestions have been made for developing plantations in suitable parts of the Empire.

A substantial part of the increased income has been applied to the provision and equipment of an extension of the existing laborarory for the study of colour measurement and colour fading. The council may be excused for feeling some satisfaction at being able to finance the building of the colour laboratory at so early a stage. During the year the technical staff has been increased by the appointment of Miss G. S. Disney, B.Sc., whose work will lie mostly in colour measurement; Mr. G. N. Hamilton, M.Sc.; and Dr. C. W. H. Story, M.Sc., Ph.D., who will work on problems arising out of colour and colour lake manufacture. In connection with the work on "bloom" of varnishes, the Association has arranged for part-time service on a consulting basis with Mr. N. K. Adam, M.A., Sorby Research Fellow of the Royal Society at Sheffield University, whose experiments in the field of molecular physics may be of great assistance in connection with the work in hand at the Research Station.

The "C.A." Annual Review

THE Annual Review Number of THE CHEMICAL AGE will be published on Saturday, December 29. Last year's issue was the largest yet issued, and this year there are good prospects that it will be exceeded both in chemical trade announcements and in editorial matter. The special contributors to the issue will include Sir William Alexander, Dr. E. T. Maxted, Mr. J. Davidson Pratt, Mr. P. Parrish, Mr. S. J. Tungay, Dr. Vargas Eyre, Mr. L. J. Hooley, Mr. H. J. Tizard and others. The year's developments of Imperial Chemical Industries will be reviewed by experts, and special reports will be included of the activities of the various chemical and allied societies.

The Calendar

Dec.		
3	Ethyl Petrol Inquiry. Evidence by Professor H. E. Armstrong.	Office of Works, St. James's Park, London.
3	University of London, University College: "Chemical Engineering Education and Research in Great Britain." W. E. Gibbs. 5.15 p.m.	University College, London.
3	Society of Chemical Industry (London Section): "Scientific Aspects of Paint Technology." Dr. L. A. Jordan. 8 p.m.	Burlington House, Piccadilly, London.
3	Institute of Chemistry and Society of Chemical Industry (Yorkshire Sections): "Poisoning and Disease in Industry." H. Whitridge Davies and Professor B. A. McSwiney.	Leeds.
4	Institute of Metals (N.E. Coast Section): "Electric Furnaces." A. Glynne Lobley. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
5	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
5	Institute of Metals (Swansea Section): "Refractories." R. M. Doidge. 7 p.m.	Thomas' Cafe, High Street, Swansea.
6	Society of Dyers and Colourists (Midlands Section): "Water and its Purification for Textile Industries and Steam Plant." C. J. Carter. 7.30 p.m.	Leicester Technical College.
6	Chemical Society: Ordinary Meeting. 8 p.m.	Burlington House, Piccadilly, London.
6	Institute of Chemistry (Manchester Section): Annual Dinner and Dance.	Manchester.
6	Society of Dyers and Colourists (West Riding Junior Branch): "The Colouring of Foodstuffs." E. I. Noble.	Bradford.
6 & 7	Institution of Chemical Engineers. Conference on Drying. 10.30 a.m.	Burlington House, Piccadilly, London.
7	Society of Chemical Industry (Manchester Section): "Colloid-Chemical Changes in Rubber and other Unsaturated Organic Compounds." Dr. Auer.	Manchester.
7	Society of Chemical Industry (Liverpool Section): Hurter Memorial Lecture. Professor H. E. Armstrong. 6 p.m.	University, Liverpool.
7	British Association of Chemists: Smoking Concert. 7.30 p.m.	Broad Street Station Buffet, London.
7	Society of Chemical Industry and Institute of Chemistry (South Wales Section): "Pollution of Rivers." Professor T. Campbell James. 7.30 p.m.	Thomas' Cafe, High Street, Swansea.

Lake Chad: A Possible New Source of Potash

By Sir Roger Onslow, Bart.

The following interesting article on a possible new source of potash reaches us from Sir Roger Onslow, Bart., of St. Tudy, Cornwall, Director of the China Clay Owners Federation, Ltd., who served in Nigeria in the West African Frontier Force in 1903-4 and in 1916-17, and was much struck by the native trade in potash.

THERE has been some talk recently, both in and out of Parliament, as to the granting of the concession to work the Dead Sea potash. In an account of the meeting of the "Near and Middle East Association," in THE CHEMICAL AGE of November 17, Lord Danesfort is reported as saying that the German potash monopoly controlled 77 per cent. of the world's supplies, Dr. Annie Homer stating that the German potash cost £4 18s. per ton at the mine head and Alsatian potash £2 18s. 2d. per ton, whereas Dead Sea Potash could be produced for less than £1 per ton.

The use of potash for agricultural purposes has largely increased of late years, probably owing to the improved agricultural scientific education carried on by the efforts of the Board of Agriculture and the propaganda on the use and value of artificial manures of Imperial Chemical Industries.

It would appear, therefore, to be advisable for some expert, or perhaps Imperial Chemical Industries itself, to investigate the commercial possibilities of the potash deposits at or near Lake Chad in Africa. Potash, called by the Hausa natives "Kungwa," is an important article of inter-native trade in Nigeria, the Cameroons, and probably over a much larger area of Africa. It can be purchased in the native market of any town in Nigeria, or at any rate that was the case in 1903–4 and in 1916–17. Native grooms insisted on a continuous supply to administer to the ponies in their drinking water, and the natives evidently used it for other purposes, judging by its free sale throughout the country.

Lake Chad, situated at the junction of Nigeria, French Sudan, and the Cameroons consists of two sheets of water, separated (or joined) by a tract of mud and marsh, in a very shallow depression. Except on the Eastern side, which is protected by sand dunes, the water level is so little below the level of the surrounding country that a strong Harmattan wind, such as regularly blows at a certain season, will cause the water to run like a tide inland sometimes for over two miles. The lake or lakes are principally fed by two rivers, the Shari and the Yobe. There is no permanent outlet.

In his book *From the Niger to the Nile*, Lieut. Boyd Alexander says that, though he found the area covered by water in 1904 smaller than previous explorers had found it, he does not think it is drying up. On the East coast, which is protected by sand dunes, the towns are quite close to the shore, those on the West coast being situated some miles away, in his opinion on account of the floods (helped by wind), which, seven years before he was there, had invaded the land to a distance of over five miles. In any case, the area of water differs very much as between the wet and dry seasons, and as between one year (or series of years) and another year (or series of years), according probably to the amount of rainfall and evaporation. The Harmattan wind from the desert, which blows during the dry season, in some seasons only intermittently, varies both in duration and intensity. It causes, owing to the fine particles of sand it carries with it, the effect of a haze, which screens the sun's rays, and this would probably affect the amount of water evaporated.

Lieut. Alexander found the northern lake 30 and the southern 45 miles across. The water is very much impregnated with potash and unpleasant to drink, but there are plenty of fish, possibly only where the inflowing rivers keep the water more pure.

I take the two following extracts out of *From the Niger to the Nile*, Vol. II, page 99 :—" Here (at Wunnda on the Kanem, N.E., coast) I saw a large amount of potash which had come a five days' journey from the interior of Kanem. The potash is made in flat cone-shaped blocks, weighing 30 lbs. each, eight of which are sold in Bornu for a dollar." From this it would appear that the potash is mined somewhere in Kanem. The dollar referred to is the old Maria Theresa silver coin, then in common use in parts of West Africa. Again, page 105 :—" This (the Shari mouth on the south of lake Chad) is the real home of the Budumas, who are a prosperous people, gaining their wealth by fish and potash, and counting it in slaves and cattle." The mouth of the Shari is on the opposite side of the lakes from the Kanem country and it was generally thought in Nigeria in 1904 that the Budumas obtained their potash from pools left by the receding waters in the dry season, the water in such pools subsequently drying up and leaving deposits of potash.

Whether by mining the original source or by some method of evaporating the waters of Chad in shallow tanks by sun heat, as is done to obtain salt from the sea on the Californian coast, there is no doubt that large supplies of potash could be obtained from the Chad district. By now, doubtless, information as to the deposits of potash, and the native trade in it, could be obtained both from our Colonial Office and from the French authorities.

As to transport, the potash could be taken in motor lorries to some point on the Gongola or Benue rivers, which are both navigable during rather more than half the year for shallow draught barges. The Gongola joins the Benue and the latter joins the Niger, and the potash could thus be cheaply conveyed to ocean steamers at Forcados at the mouth of the Niger, and, in all probability, a cargo of some sort taken up country on the return journey. The barges could be taken down stream as far as Lokoja, at the junction of the Benue and Niger, by natives using poles; from there to Forcados towing would be necessary to guide them, the water being too deep for the use of poles.

Safeguarding of Key Industries

List of Exempted Chemicals

THE Treasury have made an Order under Section 10 (5) of the Finance Act, 1926, exempting the following articles from Key Industry Duty from December 1, 1928, to December 31, 1929: Celtium oxide, chinosol, dicyandiamide, dysprosium oxide, erbium oxide, europium oxide, gadolinium oxide, holmium oxide, lutecium oxide, samarium oxide, terbium oxide, thulium oxide, ytterbium oxide.

This Order also continues till December 31, 1929, the exemption from duty of: Acid hydrocyanic anhydrous, acid lactic which satisfies the requirements of the British Pharmacopœia, acid oxalic, amidopyrin (pyramidon, dimethylamidoantipyrine), ammonium perchlorate, barbitone (Veronal, Malonal, malourea, acid diethyl barbituric, diethylmalonylurea, Hypnogen, Deba), bromural (Dormigene), cocaine crude, Dial (acid diallyl barbituric), Didial (ethyl morphine diallyl barbiturate), Elbon (cinnamoyl para oxyphenyl urea), ethylene bromide, Eukodal, furfurol, glycol ethers, guaiacol carbonate (Duotal), hydroquinone, integrators (planimeter type), R. lead acetate, lead tetra-ethyl, lipoiodin, lithium carbonate, lithium hydroxide, metaldehyde, methyl chloride, methyl sulphonal (diethylsulphonemethylethylmethane, Trional), nickel hydroxide, papaverine, phenacetin (acetparaphenetidine), phenazone (antipyrine, phenyldimethylpyrazolone, Analgesin, Anodynine, dimethyl oxychinizin), phytin, piperazine (diethylene-diamine, Dispermin), planimeters, R. potassium chlorate, potassium guaiacol sulphonate (Thiocol), R. potassium hydroxide (R. potassium caustic, R. potassium hydrate), R. potassium permanganate, pyramidon-veronal, quinine ethyl-carbonate, resorcin (resorcinol), salol (phenyl salicylate), Styracol (guaiacol cinnamate), sulphonal, synthalin, urea (carbamide), vanadium-silica compounds specially prepared for use as catalysts for sulphuric acid manufacture.

The following products, it will be noted, have not been re-exempted, and will therefore go back to the list as dutiable articles as from January 1, 1929: R acetone; acetone (fermentation); acetone synthetic; ethylene glycol.

The Uses of Aluminium Chemical Plant

By E. T. Painton

On Tuesday, Mr. E. T. Painton, of the British Aluminium Company, delivered a lecture at the Sir John Cass Institute, London, on "Aluminium Chemical Plant." The lecture is reproduced below.

THE term aluminium is commonly taken to cover a multitude of substances with widely differing properties, and it is desirable in talking of any particular application of the metal to define in clear terms what exact class of material is referred to. The material used for the so-called aluminium piston of a motor car is totally different from that used in the building of an airship, and that again is totally different from the aluminium used for chemical plant, cooking utensils or electrical conductors. The aluminium used for the construction of chemical plant is almost invariably the pure unalloyed metal, having a total of impurity lying between 0·5 and 0·75 per cent. Lower grades of pure aluminium are available, but it is desirable to use the purest metal attainable, because the presence of foreign metals reduces to some extent the almost glass-like resistance of the aluminium to chemical attack.

It is probably this particular property, and more especially what has been termed its "cleanliness" in relation to foodstuffs, which is the chief claim of aluminium for the preparation of any material used for human consumption. The fact that the substances contained in foodstuffs have no appreciable action on pure aluminium means that the surface of the metal remains smooth and unpitted, so that dirt and deposits can easily be wiped off. There is an even further important safeguard against contamination. The salts of aluminium are non-poisonous, tasteless and colourless. Even should a small quantity of aluminium go into solution no harm can possibly result.

Remarkable Resistance Due to Protective Film

The chemical resistance of aluminium is one of the surprises of chemistry. Judging from all the normal signs, its great heat of combination, its electrochemical potential, and so on, one would predict at once that here is a metal which must be extremely active in chemical combination. As a matter of fact, aluminium is an extremely oxidisable metal. It is known that the mere exposure of the surface of a freshly cut piece of aluminium to the atmosphere is sufficient to cause its immediate oxidation. The surface becomes coated with a film of oxide, and even the brightly polished surface which is so attractive in a new aluminium saucepan is only seen beneath a microscopically thin film of colourless oxide. The film is tenacious, impermeable and is extremely inert, so that the metal is protected from further oxidation.

The protection thus afforded is automatically adjusted to the intensity of the corroding medium. This resistance to corrosion through the formation of protecting films is, of course, exhibited by several other metals. Another notable example is provided by stainless steel, where iron, another extremely corrodible metal, is effectively protected by a chromium film. With these materials the resistance to corrosion is largely a function of the resistance to corrosion of the material of the film. In the case of aluminium, the oxide is an extremely inert substance, but there are certain substances, such as the caustic alkalies, which dissolve aluminium oxide readily, with the formation of aluminates, and against these aluminium will offer little resistance.

Useful Physical and Mechanical Properties

A further point which has contributed greatly to the growth of the aluminium plant industry is the ease with which the metal can be worked. Aluminium is extremely ductile, and starting with a flat sheet it is possible by hammering, spinning or pressing to work it into any conceivable shape with the maximum of ease. Different parts may be joined to make one homogeneous whole by the oxy-acetylene welding process. A weld so made is perfect in respect of strength, water tightness and appearance, and since a welded joint is homogeneous, with no foreign metal introduced as in soldering, there is no possibility of the joint deteriorating with age due to electrolytic effects. The excellence of welding has meant that there is no limitation to the size or shape of the vessels which can be made, and the storage vessels employed in industry are sometimes of very great size, so that this is a matter of considerable importance. The weld may be finished off, so that its presence is undetectable, and the interior of a vessel even though built up of a number of different pieces welded together may be smooth and continuous, with no crevices to harbour dirt or micro-organisms.

Another property which commends aluminium is its light weight. Taking a sheet of aluminium of any particular thickness, weighing exactly 1 lb., it would be found that a sheet of copper of the same dimensions would weigh 3·3 lb., a sheet of iron 2·9 lb., and a sheet of lead 4·2 lb. The importance of the lightness of aluminium is exemplified in its use in carrying pans for jam, yeast wagons, and milk transport tanks.

The Question of Cost

An important point with regard to the financial aspect of the use of aluminium is illustrated by its use for the manufacture of milk churns. Such churns are used widely abroad, but not much in this country, where tinned iron churns still hold the field. One of the objections raised to the use of aluminium in this connection is that in spite of its lightness and cleanliness, etc., it costs so much more than tinned iron that the advantages are too dear. As this question of cost is an important one, and as it applies to other classes of plant also, it must be examined in greater detail.

The price of aluminium of, say, No. 16 S.W.G. thickness, is at present about 10¾d. per sq. ft. The price of tinned iron of the same thickness is about 4½d. per sq. ft., so that even if sheet of the same thickness were used the cost of the metal would be 2·4 times as much if the apparatus were made of aluminium. If, as would probably be the case, a thicker gauge of metal were used in aluminium, the price difference would be still further emphasised.

There is, however, one very important point which alters the whole situation. In any piece of apparatus which has to withstand rough usage the life is very limited. When an iron churn comes to the end of its useful life and is scrapped, it is sold to an old iron merchant for a few coppers. When an aluminium churn reaches the end of its useful life it is by no means worthless. Aluminium is a valuable metal, and scrap aluminium may be worth as much as 50 per cent. of the value of new sheet. The life of the plant in aluminium may, moreover, be expected to be considerably longer than that of iron, which needs retinning.

Of course, with a stationary piece of apparatus, where there is little depreciation, these arguments will not apply, and provided that tinned iron will answer the purpose satisfactorily there is no need to consider aluminium at all. As a matter of fact there are few applications where tinned iron is satisfactory for stationary plant. A preferable alternative is glass-lined steel. This term covers a multitude of different materials. The better qualities of glass lined vessels are expensive, and in the majority of cases aluminium is cheaper, especially when its greater scrap value is taken into account.

Aluminium v. Copper

Perhaps the chief rival to aluminium for chemical plant is copper. Copper is somewhat akin to aluminium in many respects. Both are good conductors of heat, for example; both are expensive metals with high scrap value; both are very malleable. On the other hand, copper has two disadvantages. It is as a rule far more easily attacked chemically than aluminium, and it is not so easily welded. The welding of copper is in fact a comparatively recent development, and it is practised only by a very few firms.

As regard cost, we have to consider the relative thickness of the metal. In the case of a large pressure vessel it is necessary to use thicker metal with aluminium than with copper because aluminium has only about half the strength. Where thickness is determined solely by considerations of strength, therefore, you would have to use about twice the thickness of aluminium as for copper. It may be shown that for equal strength the cost of copper is 1·445 times the cost of aluminium.

In the case of pressure vessels it is sometimes the practice to reinforce the vessel by steel bands or ties. That is, of

course, a very logical solution. Steel is very much cheaper than either copper or aluminium, and it is uneconomical to employ extra thicknesses of copper or aluminium to obtain the requisite strength if it is possible to provide this by the use of steel reinforcement. If, then, the greater part of the strength required can be provided by steel, and the thickness of the aluminium or copper is only that necessary to provide a reasonable life against chemical attack or against the wear involved in periodic cleaning, there may be in using aluminium a greater economy than 50 per cent. over copper, even for pressure vessels.

The chief advantages of aluminium may therefore be summed up as follows: (1) Cleanliness and resistance to chemical attack; (2) ease of working, permitting the construction of vessels of all sizes and shapes; (3) lightness; and (4) cheapness.

Fermenting Vessels

Among the applications of aluminium is its use for vessels for fermentations. Brewing has, of course, been practised for many years, and the earliest fermenting vessels were made of wood. It was a common thing to find that from time to time the fermentation had not taken place properly. No proper explanation was forthcoming (though it was suspected that the trouble had something to do with the state of the wood). When further knowledge of the underlying principles of fermentation became available, it became definitely known that the trouble did indeed lie in infections from the wood.

The natural step was to coat the wood with some form of varnish or enamel, but this introduced a further difficulty in that it gave an unpleasant flavouring to the product, and the process of lining the wooden vessels with metal was introduced. Copper was the first metal employed—there was no aluminium in those days—and this gave very much better results, but even copper was found not altogether perfect. In certain circumstances copper was found to be soluble in the beer, resulting in the poisoning of the yeast.

As a result aluminium linings became very popular, and they have remained so to this day, with the exception that the present tendency is to eliminate wood altogether and to thicken up the aluminium lining so that, with a certain amount of external support from a steel framework, it will stand alone.

The use of aluminium in large dairies is somewhat akin to the use in brewing because in both cases cleanliness is essential, and in both cases liquids are dealt with in large bulk and require large sized vessels. (Mr. Painton illustrated this point by a slide showing the pasteurising plant in a Manchester dairy.)

The Varnish Industry

Next in order of importance from the point of view of aluminium plant is the varnish industry. Varnish is a solution of linseed or other oil with a fossil gum or other resinous material, together with a volatile solvent. As the fossil gums are practically insoluble in linseed oil owing to their polymerised nature a process of depolymerisation has first to be carried out, and this is in effect a simple process of destructive distillation. The process is known as gum running, and is carried out in simple pots (straight sided aluminium vessels) set over an intense coke fire in a hole in the floor. Flues and hoods are provided, also in aluminium, to take away the strongly acid fumes given off in the boiling of the gum. The quality of a varnish or lacquer is largely judged by its absence of colour, and a very pale colour is ensured with aluminium due to the fact that all the salts of aluminium are colourless.

The conditions are very severe for any metal. The melting point of the gums may vary from 300 to 500° C, and no metal set directly on a coke fire and maintained at 500° C. will last for very long. The bottom of the pots have therefore to be replaced from time to time and they are usually made separately and bolted on so that this replacement can readily be done. Sometimes while the body is made of aluminium the bottom may be made of copper or iron so as to provide a longer life. This is not necessary with the lower melting gums, nor indeed is it really necessary with the higher melting gums if a certain amount of extra care is given.

General Chemical Plant

Turning now to what may be termed the general chemical uses of aluminium, we find an almost infinite variety of plant: retorts and stills of every type, storage tanks and melting pans of all sizes and shapes, condensers and receivers, pipes and ducts of all descriptions. (Among those illustrated at the lecture were vessels for the manufacture of acetone erected in a Government factory during the war; an aluminium still; and a model deoxidiser for vegetable oils, consisting of a vacuum pan at the top, a cooling coil in the tank below, and a vacuum receiver.)

To give a fairly general idea of the substances with which aluminium may or may not be used is not altogether simple, for while it is possible to draw up two lists of substances, one giving those substances with which aluminium may be used in all circumstances and another giving those substances with which aluminium cannot be used in any circumstances, there is a very extensive third list which contains substances quite safe with aluminium in some circumstances but unsafe in others. Temperature and concentration have a profound effect on any chemical action, as also has the degree of purity of the interacting materials. As regards the purity of the aluminium itself, the variations in intensity of attack due to variations in purity are not likely to be great with metal purchased from a reliable source, though it might be borne in mind that where there is doubt a greater security would be obtained by specifying specially pure metal of aluminium content at least 99·5 per cent.

Variation in purity of the attacking substance is usually more important. For example, the alcohols, methyl, ethyl, propyl, etc., have no effect whatever on aluminium in their pure state, but it is nevertheless unsafe to store whisky or brandy in aluminium vessels because these liquids are matured in wooden casks from which a certain amount of tannic acid is absorbed, and a trace of tannic acid in alcohol causes corrosion.

Use of Aluminium with Acids

The effect of different concentrations is pronounced, especially with acid solutions. Generally, starting from very dilute solutions, there is an increase in the rate of attack with increase in concentration until a maximum is reached, after which continued increase in concentration results in a decreased rate of attack. In the case of acetic acid, for example, solutions of less than 10 or more than 90 per cent. concentration have no appreciable action at any temperature. Between these two limits the rate of attack is greater but is quite small in the cold. In the hot, however, concentrations between 10 and 90 per cent. have a rate of attack which though not rapid is perhaps too great to warrant the use of aluminium. As a matter of fact, the conditions in which the use of aluminium would not be safe with acetic acid do not normally occur in practice, and aluminium is largely used for acetic acid plant. It is stated that acetic acid conveyed in aluminium drums fetches a greater price on account of its greater purity. Propionic and butyric acids act very similarly to acetic acid, as also do lactic acid and citric acid, and indeed all fruit acids.

Nitric acid is similar also. In the cold it has no appreciable effect at any concentration. In the hot, there is no action with either very weak or very strong solutions, though for intermediate solutions, say from 20 to 40 per cent. concentration, there would be some measure of attack. The presence of lower oxides of nitrogen or of sulphuric acid increase the rate of attack, but in the ordinary conditions of working the rate of corrosion is practically negligible, and aluminium is used largely for storage and transport drums, for tanks for blending, for pipelines, and for hoods and ducts for carrying off fumes. With sulphuric acid similar effects are observed, but the rate of attack is generally more rapid. Thus while it is perhaps not unsafe to use aluminium for concentrations of less than 40 or more than 99 per cent. in the cold, it is unsafe to use it for intermediate concentrations, and it is unsafe to use it with any concentration in the hot.

Of the acids which attack aluminium both in the hot and the cold we can set down hydrochloric acid, formic acid, and tannic acid. Oxalic acid attacks aluminium slightly but not sufficiently to prevent the use of the metal in its manufacture.

Alkalis, Salts, Sulphur Compounds Etc.

As regards alkalis, caustic soda and potash dissolve aluminium in all conditions, but ammonia or ammonium hydrate merely attacks the surface forming a protective coating. It is quite safe to use aluminium with ammonia either in solution or in gaseous form. Moreover, ammonium salts, the sulphate, formate, sulphide and sulphite, have no action. Ammonium carbonate is sublimed regularly in aluminium vessels.

Aluminium cannot be used with salt solutions of more electronegative metals. Copper is deposited from copper sulphate, and mercury from mercury salts. Mercury and mercury salts are particularly deleterious with aluminium because mercury amalgamates readily forming a readily oxidisable amalgam. It is necessary to avoid the use of mercury thermometers with aluminium vessels.

Among the substances which have no action whatever on aluminium are sulphur and sulphur compounds such as sulphur dioxide or sulphuretted hydrogen. Phenol and phenol solutions are equally harmless so that aluminium can safely be used in the distillation of tars. Coke by-products generally are perfectly safe and aluminium is used largely for the recovery of by-products from coke ovens and coal distillation processes. In the manufacture of explosives aluminium is used for various nitrating processes.

The Action of Water

Finally, the subject of the corrosion of aluminium by water may be touched on. Distilled water has no action at all on aluminium at any temperature, and nor has steam, so that aluminium is used with perfect satisfaction for cooling worms, steam jacketed pans, and so on. Soft waters also have no action, but certain hard waters contain sufficient dissolved salts to have an appreciable effect after a term of years. All hard water is not dangerous, much depending on the particular salts present, so that in installing aluminium plant in a district where it has never before been used, and it is known that the local water is hard, a preliminary test on a sample of aluminium should be carried out to observe the corroding effect.

If such a test indicates an unsatisfactory resistance to corrosion, it is not essential to abandon the proposal to use aluminium for the plant in question, and the advantages of aluminium can still be utilised if precautions are taken to protect the metal. A possible solution may lie in the use of the process known as anodic oxidation, for example. In this process, the aluminium is made the anode in an electrolytic bath of chromic acid, and as a result becomes coated with a comparatively thick film of oxide which has a particularly dense and impermeable structure. The process is adopted largely for the protection of seaplane parts, the floats for example which are then found to have an almost indefinite life in spite of their immersion in water.

Reorganisation of the Lawes' Chemical Manure Co.

A CIRCULAR accompanying the report of Lawes' Chemical Manure Co. for the year ended June says that owing to loss of the export trade and severe competition from foreign superphosphate the company is not justified in retaining such large works; that it has a considerable trade in complete fertilisers and specialties which can be continued with advantage; and that the sheep dip and disinfectants department has provided a profit sufficient to justify its active continuance. The proposals are the closing of unremunerative branches of the business; the dismantling of a portion of the Barking works to clear the land for sale; the sale of surplus land, property and other assets, the drastic reduction of standing charges, and a reduction of the company's capital. It is anticipated that there will be a substantial amount of cash which will not be needed by the reorganised company, which the directors suggest should be returned to the shareholders. They believe that on the reduced capital a profit should be earned sufficient to pay a dividend on both classes of shares.

Largest Bookshop in the World

WHAT is described as "the largest bookshop in the world" is about to be erected by W. and G. Foyle, Ltd., of Charing Cross Road, London, on the site of the old Goldbeaters' House in Manette Street, mentioned by Dickens in *A Tale of Two Cities*. It will comprise six floors with two lifts, on an area of over 5,000 square feet. The total floor area will exceed 30,000 square feet, and accommodation will be provided for nearly two million volumes. The building is expected to be completed by next June. W. and G. Foyle started business 25 years ago with a few books and no capital; their customers, which then numbered three a week, occasionally total 10,000 now.

The Catechin Problem

To the Editor of THE CHEMICAL AGE.

SIR,—In reply to Dr. Malkin and Dr. Nierenstein, I need only point out that their view of the nature of a precise description is evidently very different from that generally held by organic chemists in connection with laboratory prescriptions. Their quotation from a memoir by Willstätter and Everest contains not a single detail respecting the quantities and concentrations of the reactants. At the risk of becoming tedious, I repeat that pure synthetic cyanidin chloride (not Malkin and Nierenstein's perhaps) exhibits towards hydrogen peroxide and in every other way exactly the same behaviour as natural cyanidin chloride.—Yours, etc.

ROBERT ROBINSON.

University College, London.

To the Editor of THE CHEMICAL AGE.

SIR,—Only one point raised by Dr. Everest (p. 490) requires comment. Otherwise, the ground traversed by him is the same as that covered by Professor Robinson, which leaves the chemistry of cyanidin *sub judice* (p. 454). Dr. Everest refers to his (*Proc. Roy. Soc.*, 1914, B, **87**, 449) and Willstätter's (*Sitzb. Preuss. Akad.*, 1914, 769) work on the reduction of quercetin, and suggests that we have ignored this method for the preparation of cyanidin. Our reasons for doing so are obvious:

(1) Dr. Everest's contribution is a purely qualitative work on the reduction of some plant materials such as quercetin, wallflowers, lemon peel, etc., to red coloured solutions and products resembling anthocyanins. None of the reduction products was isolated in a pure state, nor analysed by him. In our opinion, Dr. Everest's contribution represents no advance whatever on the work published by Hlasiwetz as far back as 1864 (*Sitsb. Wiener. Akad.*, p. 6), and cannot seriously be adduced as proof of the constitution of cyanidin.

(2) Willstätter's observation that, working in quantities of 2 grams, 33 grams of quercetin yield on reduction 0·165 grams "cyanidin chloride," has so far not been confirmed by any other worker, and numerous attempts made by us during the past two years have yielded negative results. This work is, in our opinion, quite inadequate to prove the constitution of cyanidin for two reasons: (*a*) The yield of reduction product is *less than half per cent.*; (*b*) since Willstätter used 0·1563 grams for analysis of carbon and hydrogen (chlorine was not estimated), the numerous comparative tests, *i.e.*, solubility, colour tests, etc., must have been carried out with something less than 0·01 gram.—We are, etc.,

T. MALKIN,
M. NIERENSTEIN.

The University, Bristol.

Failure of Chemical Merchants

AT Bankruptcy Buildings, Carey Street, London, on Tuesday, November 19, the statutory first meeting of creditors was held under the failure of David Misell and Julian Misell (trading as D. and J. Misell), 10, Rangoon Street, London, who carried on business as chemical merchants and against whom a receiving order was made on November 7 on the petition of A. Boake, Roberts and Co., Ltd., and Bush Beach and Gent, Ltd., creditors. A statement of affairs had been filed showing liabilities £2,041 and assets £1,266 nett. The debtor, David Misell, had stated in preliminary examination that in or about May, 1926, he and his son Julian decided to start in business together as chemical merchants under the above style; no deed was prepared but the profits were to be shared equally. They first traded at 15, Coopers Row, removing 12 months later to more convenient but more expensive premises at 10, Rangoon Street, E.C. Latterly, the amount of business done was not sufficient to warrant the drawings and expenses, and early last month, in consequence of pressure by creditors, a meeting of the creditors was called and a deed of assignment was executed in favour of Mr. W. A. J. Osborne as trustee for the creditors. The failure of the firm was attributed to want of capital and heavy overhead expenses. The meeting passed a resolution for the appointment of Mr. C. Latham, accountant, 8, New Oxford Street, W.C., as trustee of the estate.

Artificial Silk Developments

Important Cost Reductions Claimed

THE following information on the technical aspect of an important development in artificial silk manufacture is communicated by Mr. Andrew Clark, J.P., of Glasgow, chairman of the International Artificial Silk Co., Ltd.

Mr. Clark's statement is as follows: "By the hitherto known existing methods of production, the operations of washing, desulphurising, bleaching, and so on have to be carried out in hanks. It is this handling of the silk in hank form which causes material damage to the fibre; it is very detrimental to quality, while entailing high labour costs.

How the Damage is Avoided

"The new process, which will be known as the Brandwood process, and which is a continuous and rapid one, consists partly of a series of steps, of secret character, in the mechanism of production. These make it possible to produce viscose of a more uniform quality, suitable for the spinning of the finer counts, at a lower price than by existing methods. But the further and most marked advance is, that the whole of the operations subsequent to spinning are conducted upon the silk in compact form. That is to say, the silk is washed, desulphurised, bleached, etc., while it remains on special spools. It is, therefore, not subject to handling, and in consequence, damage to the silk is completely avoided.

"The new process goes still further. Hitherto, it has not been possible to dye artificial silk in compact form, because of the matting properties of the material; it is difficult to impregnate uniformly, even under the greatest force and pressure. For this reason, experts have always regarded it as an axiom that artificial silk must be reeled into hanks or skeins before it can be dyed. Even then many difficulties have to be encountered—difficulties which are not experienced, for example, in the dyeing of cotton and wool.

Direct Spool Dyeing Rendered Possible

"Under the new process the silk is dyed direct on the spool; it is very simple, the results are perfect, the time required is no more than ten to fifteen minutes, and the system is a continuous one, thus eliminating any possibility of damage to the material, and ensuring the utmost economy. Though it may appear incredible, even to the expert dyer who is not yet acquainted with the process, a number of colours can be dyed to pattern and design on a single thread, while the silk is held in compact form. The production costs of this new multi-colour, or Brandon dyeing, prove to be less than for ordinary solid colour dyeing. This should open up the creation of endless varieties of new coloured artificial silk goods, at no extra cost.

"The combined processes, though most scientific and accurate, are so extremely simple that they can easily be followed, and we regard the development as of such wide public importance that we are shortly arranging a demonstration of it to those interested, at convenient works near Manchester.

Larger Production of High-Grade Silk

"I think there can be no doubt that this revolutionary progress in the manufacture will bring the price of artificial silk, of the first quality, much nearer to that of cotton. When you take account of the fact that a 50 per cent. production of grade A silk from a factory is considered very satisfactory indeed, and that in future there will be a guarantee of at least 90 per cent., it will be readily seen how great the influence on cost must be.

"There is one other important advance. In the ordinary way, as I have explained, the silk is finished in hank form. The weaver cannot use it in hank form, either for manufacturing into fabric or for hosiery. It is usually wound back again either by the silk manufacturer or the commission winder, on to bobbins, and thence rewound on to pirns, this being the form required by the weaver. There is, indeed, an immense saving of time and labour all round. With the process in general use, after the viscose has been made into filaments, it usually takes two or three days to wash, stretch, bake, desulphurise, bleach and dry ready for the dyer or commission winder. All these operations can now, if necessary, be accomplished, with the addition of dyeing and sizing, if required, in less than two hours.

"To summarise the advantages in convenient form, it is conclusively proved that the new processes: Reduce the production costs by at least 50 per cent.; nearly double the percentage of first quality output; eliminate loss in sale of inferior qualities, thereby reducing still further the ratio of cost in producing the grade A quality; reduce the time of process in manufacture at least 50 per cent.; and require less plant and equipment.

"Authority for the above is contained in reports by Mr. William Bacon, B.Sc., F.I.C., etc., of Sindall and Bacon; Mr. A. J. Hall, B.Sc., F.I.C.; Mr. Hugh Griffiths, B.Sc., A.R.C.Sc., etc., chemical engineer; and Mr. Fred Ferrand, formerly works chemist to the Bleachers' Association. I would like to add that the inventions are by Lancashire men, who have studied and pioneered this particular method of the treatment of yarn and fabrics in the silk and cotton industry for over a quarter of a century."

The organisation responsible for the practical development of this discovery at present produces only on the Continent, but manufacture is to be begun at works on a forty-three acre site acquired for the purpose by the International Artificial Silk Co., Ltd., at Littleborough, near Rochdale.

Low Temperature Carbonisation

British Fuel Technologist Visiting New Zealand

ATTENTION has been concentrated for some time past in New Zealand on the subject of low temperature carbonisation, particularly from the point of view of a home supply of liquid fuel and the development of national resources generally, the installation of over 160,000 h.p. in water power, to be completed by the end of 1930, being another indication of this tendency.

Coal Oil Extraction, Ltd., associated with the International Combustion Engineering Corporation, who, it will be remembered, control the "K.S.G." and the "McEwen-Runge" processes, have had a number of projects submitted to them with regard to the development of low temperature carbonisation in New Zealand. They have now decided upon an investigation of local conditions, and have commissioned Mr. Leonard C. Harvey, a well-known expert on pulverised fuel firing and low temperature carbonisation, to visit New Zealand on their behalf, and to investigate the problem thoroughly.

"L. & N." Brown Coal

Developments in Australia

THE first ordinary general meeting of "L. and N." Brown Coal, Ltd., was held in London on Monday, the chairman of the company, Lieut.-Col. J. T. C. Moore-Brabazon, presiding.

Lieut.-Col. Brabazon described developments in connection with the formation of a subsidiary company called "L. and N." Tasmania, Ltd., formed to take over the property of the Australian Shale Oil Corporation of Tasmania. A standard "L. and N." plant was to be erected for the distillation of 100 tons of shale per day. Mr. Frank Hodges, the managing director of "L. and N." Brown Coal, said that in addition to the Tasmanian plant, plants had been ordered to distil shale at Joadga, and brown coal at the Lal Lal brown coal-mine, Victoria (the latter at present owned by Pulversised Fuel (Australia), Ltd.). In addition, "L. and N." Brown Coal itself owned large deposits of brown coal at Morwell, Australia, where plant would be erected to cope with an output of 2,000 tons of brown coal per day.

A Second London Building for I.C.I.

PLANS are being prepared for a proposed second building in Millbank, Westminster, London, for Imperial Chemical Industries, Ltd. It will equal in size and importance the first building of the company, which is now nearing completion. The site will be on the opposite side of Horseferry Road, extending along Millbank as far as the Grosvenor Ice Rink. It will have a frontage of about 600 ft. Eight storeys are provided for in the plans, which have yet to receive the approval of the London County Council.

A Bookman's Column

One of the outstanding features of chemical industry in the present century has been the tendency to eliminate waste, and wherever possible to find a profitable use for every product, however apparently useless, of a process. In the last few years some remarkable examples of this tendency have occurred in America. Mr. John B. C. Kershaw has written, and the firm of Ernest Benn has recently published, a book entitled *The Recovery and Use of Industrial and Other Wastes* (pp. 212, 25s.). The scope of the book is wide, for it deals with the following types of waste: chemical, engineering shop, foundry and metallurgical, mining and mineral, municipal and domestic, paper-pulp and paper-mill, sugar and sugar-beet, tannery and leather trades, food and stockyard, rubber manufacturing, wool scouring, wood working, etc. There are a large number of useful illustrations. Chemical engineers who desire to make themselves acquainted with what has already been achieved in the different fields of waste recovery, or to study the opportunities which exist for further research work and investigation in this special branch of industry, will find much to interest them in this book.

* * *

The subject of atomic structure is still very much in the public eye. The latest book dealing with it is *Atomic Structure as Modified by Oxidation and Reduction*, by Dr. W. C. Reynolds (Longmans, Green and Co., pp. 128, 7s. 6d.) This volume records the results of a theoretical investigation of the structural changes which occur in atoms during the processes of oxidation and reduction. Evidence is brought forward to focus attention on the association of the electrons in groups which are symmetrically distributed around the atomic nuclei. The special feature of atomic structure to which attention is directed is the presence of potential valence electrons, never exceeding six in number. Recognition of the part played by these potential valence electrons leads at once to a modified conception of the Periodic Classification of the elements. Among other subjects discussed are the nature of chromophores, the general relationships of matter and ether, and the emission and absorption of radiation; while in a chapter devoted to organic chemistry some important new considerations are raised.

* * *

For the successful working of a chemical organisation of any kind, a great deal depends on the ability of the members of the organisation to make adequate use of information already published in journals and books. The successful literature searcher must have acquired the necessary technique—the knowledge of how and where to find desired information in the library. The McGraw-Hill Publishing Co. has just issued a handy book on this subject: *Chemical Publications—Their Nature and Use*, by Dr. M. G. Mellon (pp. 253, 12s. 6d.). The object of the book is threefold: to sketch briefly the rise and development of chemical publications; to give an outline of present sources of published information; and to suggest certain exercises whereby students may be trained in proper methods of search. The material included in the book constitutes the basis of an undergraduate course of instruction in the proper use of chemical literature

* * *

The discovery of helium and the other elements of the same group forms one of the most romantic episodes in modern science. Among the group of workers, led by the late Sir William Ramsay, who carried out this research, was Professor M. W. Travers, F.R.S. The latter has been engaged in arranging the scientific papers of his former chief, and has produced, on the basis of his own knowledge and Sir William Ramsay's notebooks, a fascinating volume giving the history of this monumental piece of research. The book is entitled *The Discovery of the Rare Gases* (Edward Arnold and Co., pp. 128, 15s.), and includes facsimile reproductions from Sir William Ramsay's notes, giving original sketches of apparatus and records of experiment. It is no ordinary dry-as-dust compilation, but a really thrilling first-hand account of a unique piece of work. The author's own connection with his subject lends a most unusual degree of human interest to his pages. The volume is very handsomely produced.

Chemical Matters in Parliament

Dangerous Drugs

In answer to Col. Vaughan-Morgan (House of Commons, November 22), Sir V. Henderson stated that codeine had not been added to the schedule under the Dangerous Drugs Act. It was not regarded by most authorities as a habit-forming drug and was not included in the International Conventions of The Hague and Geneva.

Alkaloid Production in Ghazipur

In reply to Col. Vaughan-Morgan (House of Commons, November 26), Earl Winterton stated that various alkaloids of opium had been manufactured at the Ghazipur factory from waste products and contraband opium for many years, but it was not until about 1924 that they began to find a market in substantial quantities outside India. They were exported to the United Kingdom only, where their disposal for strictly medical and scientific purposes was governed by the stringent provisions of the Dangerous Drugs Act. From figures circulated in the *Official Report* it was shown that the value of the alkaloids was as follows: 1920-21, 16,266 Rs.; 1921-22, 9,123 Rs.; 1922-23, 30,205 Rs.; 1923-24, 156,993 Rs.; 1924-25, 145,211 Rs.; 1925-26, 224,887 Rs.; 1926-27 (November 1-Sep 30), 137,382 Rs.

Synthetic Rubber Research

Mr. Westwood (House of Commons, November 27), asked the Secretary for Mines if his attention had been drawn to the claim of a member of the I.G. Farbenindustrie that the production of rubber from coal on a commercial basis had possibilities of becoming a reality; and, if so, what action was he prepared to take to encourage and help scientific research and experiment in this country in this direction?

Commodore King stated that he had seen the report referred to. He understood that processes by which a material resembling rubber, in its physical and chemical properties, could be made from coal had been known for many years, but that they had not been exploited owing mainly to the high cost of production in comparison with the price and superiority of the natural product. The Government already made a grant to the Research Association of British Rubber Manufacturers, which was fully informed as to the position, and he saw no reason for further action.

Asbestos Companies Unite

Turner and Newall and Bell's United Asbestos

It is announced that Turner and Newall, Ltd., have acquired the following undertakings: Bell's United Asbestos Co., Ltd., and its controlled and associated companies; Western Chemical Co. (Paisley), Ltd.; Reid, McFarlane and Co., Ltd.; Reid, McFarlane (London), Ltd.; Reid, McFarlane and Co. (Belfast), Ltd.; Carbon Cement Co., Ltd.; and Thomas Anderson, Ltd. For this purpose the capital of Turner and Newall is to be increased to £5,297,929 by the creation of 1,297,929 new £1 shares. Turner and Newall, Ltd., successors to several old-established private companies, were incorporated in 1920, and are now the largest manufacturers of asbestos, magnesia and allied products, through their alliance with a number of other companies. In order to effect the fusion of Turner and Newall with Bell's United Asbestos Co., shares in the former company are to be allotted to the constituent members of the latter company as follows: 599,500 £1 ordinary shares and 405,000 £1 7 per cent. cumulative preference shares in Turner and Newall, Ltd., to be distributed in the form of one ordinary Turner and Newall share for each ordinary Bell's United share, and one Turner and Newall 7 per cent. cumulative preference share for each 6½ per cent. cumulative preference Bell's United share.

Meeting of Committee on Ethyl Petrol

A meeting of the Government Committee on Ethyl Petrol will be held on Monday, December 3, at 11 a.m., in Room 61 on the second floor of the Office of Works, St. James's Park, for the purpose of taking evidence in public from Professor H. E. Armstrong, F.R.S. After the public session evidence will be taken in private from Dr. G. Roche Lynch, senior official analyst to the Home Office.

From Week to Week

COLONEL SIR E. A. BROTHERTON, Bart., D.L., LL.D., chairman of Brotherton and Co., Ltd., has been nominated as High Sheriff of Yorkshire for next year.

THE AMERICAN CYANAMID CO. has signed an agreement with the British Cyanides Co., Ltd., for the formation in the United States of a new company to manufacture Beetle products.

THE AMALGAMATED ANTHRACITE COLLIERIES CO. has erected a pulverised fuel plant at Ystradgynlais, Swansea Valley, with a view to carrying out experiments with various grades of anthracite coal.

MR. A. J. T. TAYLOR has been appointed deputy chairman of Ruth's Steam Storage, Ltd., and Mr. H. E. Metcalf is resuming the position of managing director, which Mr. Taylor vacates under his new appointment.

SIR HARRY MACGOWAN has accepted the presidency of the London Homœopathic Hospital. On Tuesday, Lady MacGowan unveiled a plate put up in St. Mark's Hospital, City Road, London, in recognition of a donation of £1,000 from Sir Harry MacGowan.

THE SALT UNION, LTD., has purchased the works and estates of J. Garner and Co., Bridge Salt Works, Winsford. The property includes the works, eighteen cottages, river frontage, shipping on the river Weaver, the Winsford "Dock" house and land adjoining.

PIETER'S CONTINUOUS METHOD of coking is, states the German Press, to receive application in Great Britain. Hitherto it has been worked in France on a 200-tons-per-day basis. The process is said to be distinguished by permitting of heat recovery and a very rapid evolution of distillation products.

AN INQUEST was held at Huddersfield on November 20 on J. B. Whitehead, a chemical labourer, who fell from a ladder at the works of the British Dyestuffs Corporation on November 16. The jury returned a verdict that Whitehead died from a cerebral embolism following a diseased condition of the heart, and that death was accelerated by his fall.

THE OXY-ACETYLENE COMMITTEE of the International Acetylene Association presented a long report to the Association at its annual meeting, held in Chicago recently. The report, which is a comprehensive survey of the uses of the oxy-acetylene welding and cutting process, has now been published (pp. 106) from the offices of the Association, 30, East 42nd Street, New York, U.S.A.

AT THE PUBLIC WORKS EXHIBITION at the Agricultural Hall the Paterson Engineering Co., Ltd., were exhibiting various types of their chloronome for the chlorination of water supplies. Among other exhibits were the bath type chloronome, models of Paterson pressure filters, and a model of the bypass type chemical proportioning apparatus such as is used in connection with plants for softening hard water supplies.

THE ANNUAL REPORT of the Chemical Warfare Service of the United States army shows that during the last fiscal year much time has been devoted to the manufacture of gas masks for war reserve purposes "on a relatively large scale," and the results of the general activities of the service "have been most gratifying." It is stated that the scientific world has continued to hold its interest in the Chemical Warfare Service, and has materially aided it by advice and valuable criticism.

THE MANCHESTER SECTION of the Society of Chemical Industry has issued an appeal for funds to meet the expenses of the annual meeting of the Society in Manchester next year. It is expected that a large and representative party of prominent and influential visitors from America will attend the meeting, and in view of the generous hospitality extended to the British visitors to America this year the Section is particularly anxious to give a corresponding welcome. The King has granted his patronage to the Manchester meeting.

THE ASSOCIATION of Consulting Chemists and Chemical Engineers, Inc., New York City, has been chartered as a membership corporation without capital stock. Its objects are to advance the science and practice of consulting chemistry and chemical engineering, to improve the service of the profession, to assist in the dissemination of useful information to its clients, to the public and to all branches of the Government, etc., and to own and operate buildings, laboratories, instruments, equipment, and facilities for the members in the practice of their profession.

ARTIFICIAL SILK NEWS.—A highly important development in the international artificial silk industry was announced in New York last week, in the formation of the Associated Rayon Corporation, with a capital of $40,000,000 of 6 per cent. cumulative convertible preference stock and 2,000,000 common shares. It will acquire substantial interests in a number of artificial silk companies, including the Glanzstoff and Bemberg companies of Germany, Enka Corporation of Holland and the Snia Viscosa of Italy. An offering of stock was made in New York by Speyer and Co. and Lehmann Brothers. A portion of the issue was withdrawn for sale in Germany and Amsterdam.

LYDENBURG PLATINUM AREAS proposes to write 16s. off each £1 share, thereby reducing the issued capital from £1,460,000 to £292,000 in 4s. shares.

THE ADDRESS of Patent Lightning Crusher Co., Ltd., was given in error last week as 11, The Grange, Bermondsey. This should have been 14a, Rosebery Avenue, London, E.C.1.

LORD BIRKENHEAD, a director of I.C.I, delivered an address at the monthly luncheon of the Individualist Bookshop, at the Hotel Cecil, London, on November 21, Sir Ernest Benn, Bart., taking the chair.

DR. F. BERGIUS, speaking at the Second International Conference on Bituminous Coal, at Pittsburgh, is reported to have announced the discovery of a process for the conversion of wood-cellulose and lignin into artificial coal.

MR. H. C. PARMELEE is relinquishing the editorship of *Chemical and Metallurgical Engineering*, New York, in order to become editorial director of the McGraw-Hill publications. He will be succeeded by Mr. S. D. Kirkpatrick, who joined the staff in 1921.

RECENT WILLS INCLUDE :—Mr. B. J. M. Walsh, interested in Marley Hills Chemical Co., Ltd., £200,055 (net personalty £248,909). —Mr. S. F. Waters of Hove, retired chemical merchant, £11,661 (net personalty £11,539).—Mr. J. R. Curwen, Lancaster, mineral water manufacturer, £5,223 (net personalty £2,394).

DR. C. N. HINSHELWOOD, of Trinity College, Cambridge, lectured on Friday, November 26, on "The Laws of Chemical Change," at Leeds University, under the auspices of the Leeds Philosophical and Literary Society. He showed how the modern atomic and kinetic theories had replaced the speculations of former days.

MR. HENRY T. F. RHODES has been appointed general secretary of the Society of Chemical Industry in succession to Dr. J. P. Longstaff, who retires on March 31. Mr. Rhodes, who is relinquishing his present office of hon. secretary of the British Association of Chemists, will act as assistant secretary of the Society until Dr. Longstaff retires.

MR. N. H. GRAESSER has resigned from his position as managing director, and has retired from the board of the Graesser-Monsanto Chemical Works, Ltd. It is stated that Mrs. A. S. Graesser, Engineer-Vice Admiral Sir R. B. Dixon and Mr. C. H. Beeves have also retired from the board in favour of nominees of the Monsanto Chemical Works, Inc., which has acquired a controlling interest in the Welsh firm.

DR. S. G. BARKER, in a lecture on "Some Scientific Aspects of Wool as they Affect the Wearer," to the Society of Dyers and Colourists, at Glasgow, stated that the ultra-violet transmission through wool was 15 per cent. of the incident light. The all-important factor was the texture of the material. Another point of interest was the durability of wool and its resistance to deterioration when exposed to sunlight, the rate of deterioration in strength being about half that of other textile fibres. Methods were now being devised for the investigation of the fading of colours, the effect of perspiration, and the improvement of evenness of colouring in dyed materials.

DR. E. C. SULLIVAN is to receive the Perkin Medal for 1928, according to the result of a vote by a committee representing the Society of Chemical Industry (American Section), the American Chemical Society, the Société de Chimie Industrielle, and the American Electrochemical Society. The award has been made for Dr. Sullivan's pioneer work in the development of scientific control and production in the glass industry, particularly for the work carried out over a period of years which culminated in 1915 in the production of Pyrex. The presentation will be made on January 4, 1929, at a meeting of the chemical societies at the Chemists' Club, New York.

UNIVERSITY NEWS.—*Edinburgh*: New laboratories of the University and the Heriot-Watt College, towards the building of which the Miners' Welfare Fund Committee has made a substantial grant, were opened on Friday, November 23, by Viscount Chelmsford.—*Cambridge*: The Goldsmiths' Company will give £10,000 to the University to increase the endowment of their readership in metallurgy. The company will provide a yearly sum of £500 when a new reader is appointed in place of Mr. C. T. Heycock, who has retired, until such time as it may be convenient to transfer the capital sum.—*Sheffield*: Mr. M. Parkin has been appointed to a lectureship in glass technology, and Mr. J. R. Reedman to a research fellowship in glass industrial economics.

Obituary

MR. THOMAS E. POPE, formerly professor of chemistry in the Massachusetts Institute of Technology, on October 30, aged 80.

MR. J. W. ELMS, assistant general manager of the Paint, Lacquer, and Chemicals Department of the E.I. du Pont de Nemours Co., in Paris on October 18. Mr. Elms started his career as a chemist with the General Electric Co., and later joined the du Pont Co., at the end of the war becoming assistant director of the du Pont Chemical Co., which carried through important post-war salvage operations for the du Pont Co.

References to Current Literature

British

ANALYSIS.—Simplified methods of potentiometric and conductometric analysis and their industrial application. T. Callan and S. Horrobin. *J.S.C.I.*, November 16, pp. 329–343T.

BERYLLIUM.—The production and uses of beryllium. K. Illig. *Canadian Chem. and Met.*, November, pp. 310–313. Describes the work of the Siemens-Halske A.-G., of Germany. In a few months time the company will be producing about 100 kg. of beryllium metal per month, at about £17 per kg.

GENERAL.—Influence of steam and of hydrogen on the burning of carbon monoxide. H. B. Dixon. *Nature*, November 24, p. 805.

Some aspects of the vibration theory of odour. G. M. Dyson. *Perfumery Essential Oil Record*, November 20, pp. 456–459.

DYES AND DYEING.—Influence of the anions of the mordant on the shade of Alizarin Red Lake. P. P. Viktoroff. *J. Soc. Dyers and Colourists*, November, pp. 336–341.

Fading of dyestuffs on textile fabrics.—II, III, and IV. J. J. Hedges. *J. Soc. Dyers and Colourists*, November, pp. 341–346.

Considerations on the fastness to sulphur dioxide of fabric dyed with azodyestuffs. A. T. King. *J. Textile Inst.*, November, pp. 249–253.

VITAMINS.—Notes on the irradiation of ergosterol. T. A. Webster and R. B. Bourdillon. *Biochem. Journal*, Vol. XXII, No. 5, pp. 1223–1230. The effect of using filtered light at various temperatures; some properties of the products of irradiation after removal of unchanged ergosterol; absorption spectra and products of irradiation; possible adsorption spectrum of vitamin D.

United States

ANALYSIS.—The refractometric analysis of solutions of pure compounds. F. Urban and V. W. Meloche. *J. Amer. Chem. Soc.*, November, pp. 3003–3009. Indicates how the method may be applied to the determination of the concentration of solutions of telluric acid, selenious acid, and potassium ferrocyanide.

The quantitative determination of palladium by means of 6-nitroquinoline. S. C. Ogburn and A. H. Riesmeyer. *J. Amer. Chem. Soc.*, November, pp. 3018–3022. The palladium is determined as the co-ordinated compound Pd $(C_9 H_6 NNO_2)_2$. The reagent does not react with the other metals of the platinum group.

Carbon and hydrogen determinations using a metal tube. S. Avery. *Ind. Eng. Chem.*, November 1, pp. 1232–1234. A copper tube, protected by an outer jacket of nickel, has been successfully used for combustions.

Zirconium.—II. Detection of potassium by zirconium sulphate in the presence of ammonium ions. R. D. Reed and J. R. Withrow. *J. Amer. Chem. Soc.*, November, pp. 2985–2987. The sensitiveness of zirconium sulphate for potassium in the presence of ammonium ions is practically the same as in the absence of the latter; this detection in the presence of ammonium is an advantage over other tests.

APPARATUS.—Three laboratory devices: A vacuum stirrer, a pressure alternator, and a gauge for measuring low pressures of permanent gases in condensable vapours. R. K. Taylor. *J. Amer. Chem. Soc.*, November, pp. 2937–2940.

CHEMICAL ENGINEERING.—What's wrong with the plant's engineering office. L. Eddy. *Chem. Met. Eng.*, November, pp. 682–684.

Loss calculations in dissolving, leaching and extraction. C. V. Iredell. *Chem. Met. Eng.*, November, pp. 685–686.

GENERAL.—Storing, distributing, and using hydrochloric acid in the plant. S. Schein. *Chem. Met. Eng.*, November, pp. 673–676.

The reduction of tricalcium phosphate by carbon. K. D. Jacob and D. S. Reynolds. *Ind. Eng. Chem.*, November 1, pp. 1204–1210. Volatilisation of phosphorus from mixtures of tricalcium phosphate and carbon begins at 1150° C., and under favourable conditions the reaction is completed in the hour at 1325° C., or in 10 minutes at 1500° C.

The physical side of textile chemistry. A. A. Claflin. *American Dyestuff Reporter*, November 12, pp. 709–712.

ORGANIC.—Alkyl orthosilicates. A. W. Dearing and E. Emmet Reid. *J. Amer. Chem. Soc.*, November, pp. 3058–3062. *n*-Butyl-, *n*-amyl-, *n*-heptyl-, and *n*-octyl-orthosilicates have been prepared. Ethyl orthosilicate may be used to prepare silica gel free from strong electrolytes.

The decomposition of organic compounds at high temperatures and pressures. L. R. Herndon and E. Emmet Reid. *J. Amer. Chem. Soc.*, November, pp. 3066–3073. Investigations on alcohols, acids, aldehydes, hydrocarbons, etc.

German

APPARATUS.—Apparatus for the production and mixing of solutions by electric regulation. F. Petzold. *Chemische Fabrik*, November 21, pp. 668–669.

COLLOID MILLS, ETC.—The technique and economics of mechanical methods of dispersion. F. Hebler. *Chemische Fabrik*, November 21, pp. 665–666.

GENERAL.—Tap-greases for high vacuum and other purposes. F. Petzold. *Chemische Fabrik*, November 21, pp. 667–668.

The observation of explosion limits in works. G. Weissenberger and L. Patti. *Zeitschrift angewandte Chem.*, November 24, pp. 1262–1264. Deals with the necessity of knowing the explosive limits of volatile substances used in industry, in order that suitable precautions may be taken.

ORGANIC.—A method for the technical production of scopolamine. F. Chemnitius. *Journal Praktische Chem.*, Vol. 120, Part 8, pp. 221–224.

Miscellaneous

CHEMICAL ENGINEERING.—Modern ideas on the formation and prevention of boiler incrustations. R. Stumper. *Bulletin Société Chimique Belgique*, October, pp. cv-cxxii (in French).

COLLOIDS.—The flocculation of mixtures of colloids of the same sign. A. Bontaric and M. Dupin. *Bulletin Société Chimique France*, October, pp. 1059–1062 (in French).

ELECTROCHEMISTRY.—A new iodoso-benzene electrode (iodosoiodylo) for the determination of *p* OH and of *p* H. F. Grossmann. *Bulletin Société Chimique France*, October, pp. 1063–1072 (in French).

MICROANALYSIS.—Contribution to elementary microanalysis. R. Goubau. *Bulletin Société Chimique Belgique*, October, pp. 335–344 (in French).

ORGANIC.—The nitrogen compounds from Fushun shale tar. —I. and II. T. Eguchi. *Bulletin Chem. Soc. Japan*, September, pp. 227–234; October, pp. 235–243 (in English). The following compounds have been isolated: 3- and 4-methylpyridine; 2 : 3-, 2 : 5-, 3 : 5-, and 3 : 4-dimethylpyridine; 2 : 4-methylethylpyridine; 2 : 3 : 6-, 2 : 3 : 5-, and 2 : 4 : 5-trimethylpyridine; 2 : 3 : 4 : 6-tetramethylpyridine; 2 : 3 : 6-(?) and 2 : 6 : 4-dimethylethylpyridine; and a new unknown base, $C_7H_5O_4N$, called pyrindane (in view of the fact that it seemed to be a cyclopentenopyridine).

The phenol- and cresol-sulphochlorides. E. Riesz, F. Berndt and G. Hitschmann. *Monatshefte*, Vol. 50, Parts 4–5, pp. 328–334 (in German).

The electrolytic reduction of cyclic acid imides to hydrogenated cyclic bases. E. Späth and F. Breusch. *Monatshefte*, Vol. 50, Parts 4–5, pp. 349–356 (in German). Using electrodes of chemically pure lead, the following results and yields were obtained among others: 3-methylsuccinimide gave 32 per cent. of 3- methylpyrrolidine; 3- phenylsuccinimide gave 40 per cent. of 3-phenylpyrrollidine; phthalimide gave 32 per cent. of dihydroisoindole; and homophthalimide gave 15 per cent. of tetrahydro*iso*quinoline.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

299,075. TREATMENT OF GASES WITH LIQUIDS IN SCRUBBING TOWERS. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 20, 1927.

The usual construction of scrubbing towers for treating gases with liquids is not suitable when the liquid contains solid matter in suspension, since the solid matter is liable to clog up the interstices between the filling material and increase the resistance to the flow of gas and liquid. In this invention, the washing liquid containing solid matter in suspension is admitted at 3 and sprayed at 4 on to two spiral surfaces 1, 2, which are curved and inclined towards the axis of the tower. The gas is admitted at 5 and drawn off at 6. The curving of the surface towards the centre counteracts the centrifugal force of the liquid and keeps the surface uniformly covered. The spiral surface may be inclined as

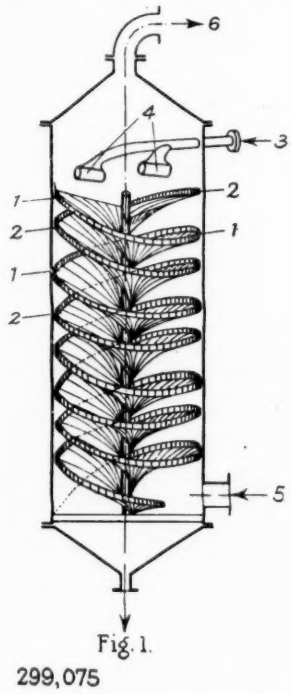


Fig. 1.

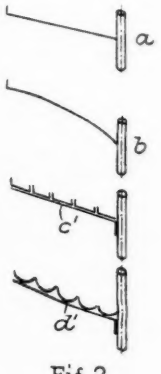


Fig. 2.

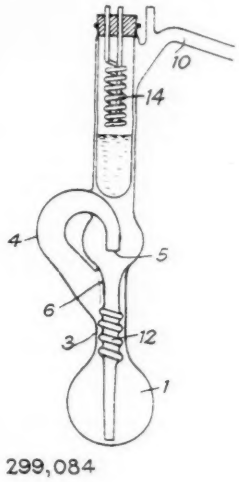
299,075

shown at *a*, *b*, or it may be subdivided into several coaxial strips mounted on a carrier c^1, d^1. In another construction the spiral surface may be subdivided into sectors, the direction of inclination of which may change.

This apparatus renders it possible to use a suspension of quicklime or calcium carbonate for the absorption of nitrogen oxides produced by combustion of ammonia in air, instead of using the more expensive ammonium carbonate. The apparatus is also suitable for the absorption of carbon dioxide by an ammoniacal solution of common salt which involves the precipitation of sodium bicarbonate.

299,084. DISTILLATION, RECTIFICATION OR EVAPORATION, APPARATUS FOR. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 20, 1927.

Vapour from the distillation vessel 1 rises through tube 3, 4 which is shaped to reverse the direction of flow and is constricted towards the mouth 5 so that the separation of drops is facilitated. The separated liquid is projected downwards against the return tube 6 and returns to the vessel 1. Vapour passes upwards to the outlet 10. The tube 6 may have a spiral formation 12, and the reflux tube may be



299,084

provided in its upper portion with a liquid column having a reflux cooler 14.

299,234. ACETALDEHYDE FROM ACETYLENE, MANUFACTURE OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 2, 1928.

The conversion of acetylene into acetaldehyde by treating with an aqueous solution of mercuric sulphate involves difficulties due to the action of mercuric sulphate on the material of the apparatus. These difficulties are overcome by employing apparatus constructed of or lined with a chromium-nickel steel containing molybdenum, *e.g.*, iron about 70 per cent., chromium 19–20 per cent., nickel 7–8 per cent., molybdenum 2–3 per cent. The high pressure process described in Specification No. 278,324 (see THE CHEMICAL AGE, Vol. XVII, p. 515) may be conducted in such apparatus.

299,279. SULPHONATED AMINO-ANTHRAQUINONE, MANUFACTURE OF. Imperial Chemical Industries, Ltd., Broadway Buildings, London, S.W.1, A. Davidson, W. W. Tatum, and G. E. Watts, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, May 30, 1928.

Aminoanthraquinone when treated with sulphuric acid is usually converted into indanthrone, but this reaction may be almost entirely suppressed under special conditions and a good yield of 1-aminoanthraquinone 2-sulphonic acid obtained. The proportion of aminoanthraquinone to sulphuric acid must be in the molecular ratio 1·0 to 1·0–1·5. If crude α-aminoanthraquinone is used, the temperature must be between 210° and 240° C., but with pure α-aminoanthraquinone a slightly higher temperature may be used. A yield varying from 75 per cent. for crude α-aminoanthraquinone to 90 per cent. for pure α-aminoanthraquinone may be obtained.

299,333. DYESTUFF INTERMEDIATES, PRODUCTION OF. W. Smith, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Scotland. Application dates, April 19, 1927, and January 9, 1928.

The process is more particularly for the preparation of 2-amino-3-chlor-anthraquinone. 2-amino-anthraquinone is chlorinated to the di-chlor stage and then partly dehalogenated —*e.g.*, with alkaline hydrosulphite at a raised temperature. The α-chlorine atom is eliminated, and the leuco body is oxidised to obtain 2-amino-3-chlor-anthraquinone. The process can also be applied to the preparation of other amino-anthraquinones by removing the halogen from the

α-position. The alkaline medium employed may be a hydroxide of an alkali or an alkaline earth metal, and the reducing agent may be a hydrosulphite, metal, or glucose. Examples are given of the preparation of crude 1 : 3-dichlor-2-aminoanthraquinone from 2-aminoanthraquinone, and its partial dehalogenation with various reducing agents followed by oxidation of the leuco compound.

299,342. ALIPHATIC ACID ANHYDRIDES, MANUFACTURE OF. British Celanese, Ltd., and H. Dreyfus, 8, Waterloo Place, London, S.W.1, and W. Bader, of British Celanese, Ltd., Spondon, near Derby. Application date, July 23, 1927.

Liquid aliphatic acids, particularly acetic acid, or their metal salts are treated with phosphoric acids of lower degree of hydration than ortho-phosphoric acid, or salts of such phosphoric acids. Thus glacial acetic acid may be mixed with a sodium salt of metaphosphoric acid, and the mixture boiled. A high yield of acetic anhydride can be obtained by distillation. Sufficient acetic acid is employed in the reaction to convert the metaphosphoric acid or metaphosphate to ortho-phosphoric acid or ortho-phosphate. The temperature of the reaction is preferably 150° to 180° C., and the process may be performed as a continuous cycle with regeneration of the phosphoric acid or phosphate.

299,481. TREATMENT OF GASES OR VAPOURS FOR THE EXTRACTION OF HYDROCARBONS. P. M. Salerni, Les Falaises, Route de Villefranche, Nice, France. Application date, April 26, 1927.

Gas or vapour containing hydrocarbons is given a whirling motion and projected into a spiral passage in contact with an absorbing oil which is kept on the surface of the spiral passage by centrifugal force. The oil is withdrawn and then treated for the separation of the hydrocarbon, and the gas can be treated again..

299,483. SILICA FROM SILICATE SOLUTIONS, PREPARATION OF. P. Spence and Sons, Ltd., T. J. I. Craig and A. Kirkham, Manchester Alum Works, Holland Street, Manchester. Application date, April 28, 1927.

A hot solution of alkali silicate is treated with acid alkali carbonate and or carbon dioxide in the presence of alkali-monocarbonate. Carbon dioxide is used in sufficient amount to convert the alkali into monocarbonate. Silicate is precipitated and the precipitate filtered and washed with mineral acid and finally with water. The product is a very bulky hydrated silica, 1 gramme occupying about 10 cubic centimetres. The liquor may be used as the source of alkali carbonate for this process.

299,487. DIMETHYLOL UREA, MANUFACTURE OF. Pollopas, Ltd., 1, Oxford Street, Nottingham, E. C. C. Baly and E. J. Baly, 10, East Albert Road, Liverpool. Application dates, June 24 and November 11, 1927.

Urea and formaldehyde are condensed in aqueous solution which is slightly alkaline, in the presence of a concentration of hydroxyl ion, such that substantial rise of temperature is prevented. The concentration of alkali should be between N/50 and N/200 of caustic soda or other alkali of the same hydroxyl ion concentration. An excess of formaldehyde of about 10 per cent. is used, and the temperature is kept below 35° C. A very pure dimethylol urea is obtained, having a melting point above 134° C.

299,492. HYDROGEN, HYDROGEN NITROGEN MIXTURES, OR HYDROGEN-CARBON MONOXIDE MIXTURES, PROCESS FOR THE PRODUCTION OF. M. Casale-Sacchi, Villa Porticciuolo, Rapallo, Italy. Application date, July 25, 1927.

In the reaction of carbon monoxide and steam in the presence of a catalyst to obtain hydrogen and carbon dioxide the gaseous products always contain some carbon monoxide which is difficult to remove. In this invention, the reaction is carried out by the use of water in the liquid state at a temperature below the critical temperature of water, and at a pressure above the vapour pressure of the water at that temperature ; thus a temperature of 250° C. may be employed with the pressure above 45 kilos per square centimetre. The catalyst may be reduced copper, nickel, iron, thallium, platinum, or palladium, or metal oxides, or metal salts of weak inorganic acids. The water may contain the catalyst and the gas containing carbon monoxide may bubble through a column of it at the proper temperature and pressure. The reaction is complete, and no carbon monoxide remains. This process is more economical in power, since no generation of steam is necessary. The process is also applicable to the production of water gas and producer gas or other gas containing carbon monoxide, or the production of hydrogen or nitrogen-hydrogen mixtures. The gases are obtained in a compressed state suitable for ammonia or methanol synthesis.

299,501. INTERMEDIATES AND DYES. British Dyestuffs Corporation, Ltd., Haxagon House, Blackley, Manchester, and M. Mendoza, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, July 27, 1927.

The process is for the preparation of intermediates of the type

substituted in position 5 or carrying a benzo group in positions 5, 6, in which Ar represents an aryl residue carrying one or more amino groups with or without other substituent groups. These compounds are obtained from mercapto compounds containing the groups SH, OH, and COOH in positions 1, 2, and 3 respectively, and substituted in position 5, or carrying a benzo group in positions 5, 6. The mercapto compounds are obtainable by reduction of the corresponding sulphonyl chlorides. The mercapto compounds are converted into the above intermediates by condensation with halogenated aromatic nitro compounds having reactive halogen followed by reduction of the condensation products to amino or diamino sulphides. An amino diaryl sulphide prepared as above may be diazotized and coupled with a coupling component with or without further diazotizations and couplings to form polyazo compounds, or a meta diamino diaryl sulphide obtained as above may be treated with nitrous acid or may be coupled with diazo compounds to obtain azo dyes. Several examples are given.

299,511. SULPHUR DYESTUFFS, MANUFACTURE OF. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 28, 1927.

Orange dyeing sulphur dyestuffs are obtained by heating 2-nitro or 2-amino-4-acetyl toluidine with sulphur at 200° to 260° C. in the presence of two or more molecules of benzidine. Yellow sulphur dyestuffs are obtained by heating 3-nitro- or 3-amino-4-acetyl-toluidine with sulphur to 180° to 260° C. in the presence of two or more molecules of benzidine. The products give dyeings of good clearness and fastness to boiling.

299,585. INDIARUBBER, PRESERVATION OF. Rubber Growers' Association, Inc., 2, 3, 4, Idol Lane, Eastcheap, London, E.C.3, G. Martin and W. Davey, Imperial Institute, London, S.W.7. Application date, September 26, 1927.

The ageing of rubber is prevented by the use of latex serum and caustic soda, caustic potash, sodium carbonate or other base or alkali added to the rubber before vulcanisation. The latex serum may be digested with the alkali, dried, and the product added to the rubber.

299,588. RECOVERY OF HYDROGEN FROM GASEOUS MIXTURES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 29, 1927.

Gas containing hydrogen with methane and other hydrocarbons is partly purified by condensations and cooling, *e.g.*, at −150° C. The gas is then treated with active charcoal, silica gel, or other highly porous gel to remove final traces of impurities.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—272,198 (C. Stiepel) relating to fatty acids containing hydroxy-fatty acids, see Vol. XVII, p. 135 ; 277,670 (I.G. Farbenindustrie Akt.-Ges.) relating to benzanthrone carboxylic acids, see Vol. XVII, p. 467 ; 281,290 (I.G. Farbenindustrie Akt.-Ges.) relating to phenyl-thioglycollic acids containing

halogen and alkyl groups in the nucleus, see Vol. XVIII, p. 104; 282,803 (J. R. Geigy Akt.-Ges.) relating to alkyl-isorosinduline sulphonic acids, see Vol. XVIII, p. 224; 284,280 (H. T. Böhme-Akt.-Ges.) relating to sulphonation of fats, fatty oils, or fatty acids, see Vol. XVIII, p. 305; 284,345 (H. Carroll) relating to production of light hydrocarbons, see Vol. XVIII, p. 326; 284,661 (Zaidan Hojin Rikagaku Kenkyujo) relating to pure alumina, see Vol. XVIII, p. 327: 290,986 (K. Brodowski) relating to compounds of metal and sulphur, see Vol. XIX, p. 85.

International Specifications not yet Accepted

297,385. Synthetic Drugs. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, September 20, 1927.

Racemic phenyl-propanol-methylamine is treated with *l*-tartaric acid, and the *l*-tartrate of the *l*-base separates out. The *l*-base is identical with natural *l*-ephedrine.

297,478. Dyes. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, September 23, 1927.

The dyestuff 1:2-aminonaphthol-4-sulphonic acid —→ α-naphthol is chromed with alkali chromite and subjected to nitrosation. The product is dissolved in caustic soda, heated with sodium sulphide, and neutralised with acetic acid. Steel-blue shades are obtained on wool and silk.

297,667. Maleic Acid and Anhydride. A. Boehringer, Nieder-Ingelheim-on-Rhine, Germany. International Convention date, September 24, 1927. Addition to 285,426.

Specification 285,426 (see The Chemical Age, Vol. XVIII, p. 368) describes the catalytic oxidation of furfural to obtain maleic acid and anhydride. In this invention, oxygen or air is employed in an excess of 20-100 times the theoretical amount. The pressure may be 50–250° C. and the pressure may be above or below normal.

297,687. Dyes. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, September 24, 1927.

Azo dyestuffs containing one or more groups capable of combining with metal are treated with metal compounds obtained by reaction of a caustic alkali, an organic compound containing hydroxyl groups, and a hydroxide of the metal. Thus, in an example, the dyestuff 5-nitro-2-amino-phenol→ 2-*o*-anisylamino-5-naphthol-7-sulphonic acid is boiled with dilute caustic potash containing hydrated copper hydroxide dissolved in potassium hydroxide, glycerol, and water.

297,726. Vulcanizing Rubber. Rubber Service Laboratories Co., Akron, Ohio, U.S.A. (Assignees of W. Scott, 312, Beechwood Drive, Akron, Ohio, U.S.A.). International Convention date, September 26, 1927.

A vulcanizing accelerator is made by saturating an aldehyde with gaseous ammonia below 25° C., and then treating with an equimolecular proportion of the same or a different aldehyde in a closed vessel at 90° -95° C. A small quantity of butyric acid is preferably present. The preferred aldehydes are butylaldehyde, heptaldehyde, crotonaldehyde, aldol. Examples are given.

297,777. Sodium Perborate. Roessler and Hasslacher Chemical Co., Perth Amboy, N.J., U.S.A. International Convention date, September 27, 1927.

Borax solution is treated with sodium perborate at 15° C. till metaborate and some perborate are formed, and then with hydrogen peroxide at 10° C. The solution is cooled to 0° C. to obtain crystals of sodium perborate, and the liquor is used in the next operation.

297,839. Salts of Halogen-substituted Tetra-ammonium Bases. E. Glucksmann, 54, Martin-Lutherstrasse, Schoneberg, Berlin. International Convention date, September 29, 1927.

Salts of halogen-substituted aliphatic tetra-ammonium bases such as $(C_2H_5)_3N(OH) . C_2H_4Br$ are made by treating a salt of the base with a metal salt of an acid., the metal forming an insoluble salt with the anion of the initial tetra-ammonium salt. Decomposition of the product may be prevented by adding an excess of the acid to be bound to the tetra-ammonium base.

Latest Notifications.

300,629. Process for the production of potassium carbonate. Kali-Industrie Akt.-Ges., Thorssell, C. T., and Kristensson, A. November 18, 1927.

300,630. Process for the preparation of alkali sulphates. Chemie-verfahren Ges. November 18, 1927.

300,632. Process for the production of nitrates of the alkalis and alkaline earths. Kali-Industrie Akt.-Ges., Thorssell, C. T., and Kristensson, A. November 18, 1927.

300,579. Process for the production of carbon disulphide. I.G. Farbenindustrie Akt.-Ges. November 15, 1927.

300,548. Manufacture of acetone from acetylation liquors. Wacker Ges. Für Elektrochemische Industrie Ges., Dr. A. November 14, 1927.

300,611. Treatment of black powder. Imperial Chemical Industries, Ltd. November 16, 1927.

300,641. Method of and apparatus for preserving ether. Mallinckrodt Chemical Works. November 17, 1927.

300,900. Process for the production of refined hydrocarbon oils and the like. I.G. Farbenindustrie Akt.-Ges. November 19, 1927.

300,549. Manufacture of acid dyestuffs of the phenonaphthosafranine series. Geigy Akt.-Ges., J. R. November 14, 1927.

300,551. Manufacture of nitro-celluloses. I.G. Farbenindustrie Akt.-Ges. November 14, 1927.

300,552. Manufacture of nitro-cellulose. I.G. Farbenindustrie Akt.-Ges. November 14, 1927.

300,557. Manufacture of azo-dyestuffs. I.G. Farbenindustrie Akt.-Ges. November 14, 1927.

300,563. Process for dehydrating vapour mixtures containing acetic anhydride and water. I.G. Farbenindustrie Akt.-Ges. November 14, 1927.

300,662. Preparation of anthraquinone vat dyes. Chemical Works, formerly Sandoz. November 18, 1927.

300,916. Dyeing artificial silk. Soc. of Chemical Industry in Basle. November 19, 1927.

300,919. Process for the preparation of ammoniacal and potassium phosphates. Soc. De Produits Chimiques des Terres Rares. November 19, 1927.

300,922. Process for manufacturing a green vat dyestuff from 1.12 perylene quinone. Bensa, F. November 19, 1927.

300,923. Process for the manufacture of glacial acetic acid from aqueous acetic aicd. I.G. Farbenindustrie Akt.-Ges. November 19, 1927.

Specifications Accepted with Date of Application

274,130. Dyestuffs, Manufacture of. Soc. of Chemical Industry in Basle. July 10, 1926.

275,663. Liquid and other hydrocarbons and derivatives, Manufacture of, by the destructive hydrogenation of carbonaceous materials. I.G. Farbenindustrie Akt.-Ges. August 7, 1926.

276,972. Denitration of waste sulphuric acid mixtures. W. Büsching. September 3, 1926.

271,853. Coalescing copper. Cooper Deoxidation Corporation. May 26, 1926.

273,735. Synthetic ammonia, Manufacture of. F.Uhde. July 2, 1926.

279,421. Alkaline reacting nitrogen fertilizer, Production of. N. Caro and A. R. Frank. October 23, 1926.

279,811–2. Cyanamides of calcium and magnesium or mixtures containing the same, Production of. N. Caro and A. R. Frank. October 27 and 28, 1926.

281,298. Aromatic hydrocarbons, Manufacture of. I.G. Farbenindustrie Akt.-Ges. November 24, 1926.

283,112. Acetal, Manufacture of. Soc. Anon. des Distilleries des Deux-Sevres. January 3, 1927.

284,700. Nitrating glycerine, glycol, and similar alcohols, Process of and Apparatus for. A. Schmid and J. Meissner. February 5, 1927.

290,992. Separation in the anhydrous state of fatty acids containing in dilute aqueous solutions. Distilleries des Deux-Sevres. May 23, 1927. Addition to 273,744.

297,766. Soluble cellulose esters of higher fatty acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. September 27, 1927. Addition to 283,181.

300,142. Methyl alcohol, Manufacture of. British Celanese, Ltd., W. Bader, and S. J. Green. May 2, 1927.

300,149. Metallic magnesium, Production of. W. Koehler. July 29, 1927.

300,184. Alumina, hydrochloric acid and alkali compounds, Production of. A. L. Mond. (*I.G. Farbenindustrie Akt.-Ges.*) August 4, 1927.

300,233. Iron compound, Preparation of—from solutions of iron, and its conversion to iron oxide. O. S. Neill. August 9, 1927.

300,299. Dyestuffs. O. Y. Imray. (*Soc. of Chemical Industry in Basle.*) August 9, 1927.

300,285. Hydrogenated aromatic amino compounds, Manufacture of. K. and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) May 4, 1927.

300,286. Synthesis of aromatic arsenic compounds. A. D. Macallum. May 4, 1927.
300,287. Vulcanizing rubber. A. H. Marks and P. Russell. (*Rubber Service Laboratories Co.*) May 9, 1927.
300,219. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 7, 1927.
300,294. Synthetic organic compounds. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) July 7, 1927.
300,321. Pyrazolones and dyes therefrom. Imperial Chemical Industries, Ltd., and H. Mendoza. August 19, 1927.
300,328. Hydrogen and carbon monoxide, Production of mixtures of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 24, 1927.
300,329. Fertilizer containing urea and phosphate, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) August 24, 1927.
300,330. Metallic compounds of ethylenethiourea, Manufacture of. G. T. Morgan and F. H. Burstall. August 25, 1927.
300,331. Condensation products of the benzanthrone series, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) August 25, 1927.
300,348. Solid calcium cyanide and double compounds thereof with ammonia, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 19, 1927.
300,369. Hydrocyanic acid, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) October 13, 1927.
300,394. Latex, Treatment of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) November 18, 1927. Addition to 294,412.
300,401. Heavy metal azides, Manufacture of. O. Matter. November 25, 1927.
300,402. Manures containing nitrogen and potassium, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 3, 1927.
300,407. Dyestuffs of the anthracene series, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) December 9, 1927.
300,418. Isopropyl acetate, Manufacture of. C. Arnold. (*Standard Oil Development Co.*) December 24, 1927.
300,425. Dyestuffs containing chromium, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) January 11, 1928.
300,429. Aluminium silicon alloys, Production of. Vereinigte Aluminium Werke Akt.-Ges., and H. Schorn. January 23, 1928.
300,432. Vat dyestuffs, Production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) February 1, 1928.
300,438. Iron ores, Method of treating. A. Holmberg. February 11, 1928.
300,456. Latex, Preservation of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 2, 1928. Addition to 294,412.

Applications for Patents

Appareils et Evaporateurs Kestner. Production of nitrate of ammonia. 34,076. November 20. (France, January 31.)
Bensa, F. Manufacture of green vat dyestuff. 33,926. November 19. (Austria, November 19, 1927.)
Blagden, J. W., Howard and Sons, Ltd., and Huggett, W. E. Manufacture of synthetic menthol. 33,903. November 19.
Caro, N. and Frank, A. R. Production of hydrocyanic acid. 34,685. November 24. (Germany, November 24, 1927.)
Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Extracting titanium oxide from ores. 33,938. November 19.
Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Chemical treatment of wood. 33,939. November 19.
Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 33,940. November 19.
Carpmael, A. and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphur dyestuffs. 34,100. November 20.
Dutoit, P. Manufacture of pentasulphide of phosphorus. 34,426. November 22. (Switzerland, December 1, 1927.)
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Rubber articles. 33,877. November 19.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Carrying out exothermic gas reactions. 33,878. November 19.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of finely-divided metals. 33,879. November 19.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of urea, etc. 33,880. November 19.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of vat dyestuffs. 33,881. November 19.
I.G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Accumulator plates. 34,057. November 20.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of pigment dyestuffs. 34,199. November 21.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of lacquers. 34,371. November 22.
I.G. Farbenindustrie Akt.-Ges and Johnson, J. Y. Manufacture of hydrocarbons. 34,372. November 22.
I.G. Farbenindustrie Akt.-Ges and Imray, O. Y. Esterifying polyvalent alcohols. 34,379. November 22.
I.G. Farbenindustrie Akt.-Ges. Electric accumulators. 34,380. November 22.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of soft rubber products. 34,512. November 23.
I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of resilient tyres, etc. 34,527. November 23. (August 30.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of preparations having a tuberculin action. 33,906. November 19. (Germany, December 12, 1927.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of glacial acetic acid. 33,941. November 19. (Germany, November 19, 1927.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of packing-material for footwear. 33,942. November 19. (Germany, November 19, 1927.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of polyazo dyestuffs. 34,209. November 21. (Germany, November 22, 1927.)
I.G. Farbenindustrie Akt.-Ges. Photographic developers. 34,228. November 21. (Germany, November 21, 1927.)
I.G. Farbenindustrie Akt.-Ges. Employing cerium in production of iron, etc. 34,269. November 21. (Germany, December 17, 1927.)
I.G. Farbenindustrie Akt.-Ges. Kinematograph films. 34,382. November 22. (Germany, November 22, 1927.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of cellulose esters. 34,383. November 22. (Germany, November 23, 1927.)
I.G. Farbenindustrie Akt.-Ges. Treating magnesium etc. alloys. 34,412. November 22. (Germany, February 2.)
I.G. Farbenindustrie Akt.-Ges. Manufacture of halogen-naphthalene-ketones. 34,523. November 23. (Germany, November 26, 1927.)
I.G. Farbenindustrie Akt.-Ges. Refining active carbon. 34,559. November 23. (Germany, November 26, 1927.)
Laing, B. and Nielsen, H. Distillation of carbonaceous materials. 34,194. November 21.
Loveluck, R. J., Scottish Dyes, Ltd., and Thomas, J. Production of anthraquinone derivatives. 34,583. November 23.
Selden Co. Catalytic apparatus. 34,109. November 20. (United States, December 5, 1927.)
Selden Co. Catalytic oxidation of organic compounds. 34,201. November 21. (United States, November 21, 1927.)
Silica Gel Corporation and Wade, H. Catalysing gaseous reactions. 34,095. November 20. (July 12, 1927.)
Soc. de Produits Chimiques des Terres Rares. Preparation of ammoniacal and potassium phosphates. 33,922. November 19. (France, November 19, 1927.)
Soc. of Chemical Industry in Basle. Dyeing artificial silk. 33,907. November 19. (Switzerland, November 19, 1927.)
Soc. of Chemical Industry in Basle. Dyestuffs. 34,694. November 24. (Switzerland, November 24, 1927.)

French Report on Beet Drying

A REPORT on the Oxford process of beet sugar production, prepared by the French chemical engineer, Professor D. Sidersky, and issued on Saturday, November 24, deals with the method of drying beet developed by Dr. B. J. Owen at the Institute of Agricultural Engineering, Oxford, and now in operation at Eynsham. Following a detailed study of the Oxford process in the light of a lifelong experience of beet sugar production, Professor Sidersky says it has the following advantages over the usual method of extracting sugar from fresh beets: By spreading the production of sugar over at least 320 days, instead of the usual restricted period of 80 days, a factory and its extraction plant may be reduced to a quarter of the normal size. A central factory, with two or three independent drying stations, will be capable of working 100,000 tons of beet under the Oxford process, and will cost no more than an ordinary small sugar refinery working 25,000 tons of beet per annum. There is a notable saving in manual labour, obtained by the omission of several stages in the usual process, and also a substantial reduction in the expenditure on such things as coke, lime, oils, and greases. The separate drying operation does not involve any increase in the total quantity of coal used. The extraction of sugar from the dried cossettes is very much easier than from fresh beet, the juice or syrup being free from micro-organisms and bacterial impurities. While over 3 per cent. of the sugar in the beet is lost under the usual method, there is no such loss with the Oxford process, with a resultant gain in the sugar yield of 25 kilogrammes per ton of beet. "The outstanding conclusion from all that has been set out," writes Professor Sidersky, in summing up his report, "is that the Oxford process reduces the cost price of beet sugar to a level hitherto undreamt of."

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC. 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall., pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised, 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. per gall. 1929—1s. 11d. per gall.

ACID CRESYLIC 99/100.—2s. 5d. to 3s. per gall. 97/99.—2s. 2d. to 2s. 3d. per gall. Pale, 95%, 1s. 11d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—7¾d. to 8d. per gall. Unstrained, 7½d. to 7¾d. per gall.

BENZOLE.—Prices at works: Crude, 10d. to 10½d. per gall.; Standard Motor, 1s. 4d. to 1s. 4½d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 5d. to 1s. 10d. per gall. Firm. Pure, 1s. 10d. to 2s. per gall.

XYLOL.—1s. 3d. to 1s. 11d. per gall. Pure, 1s. 6d. to 1s. 7d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; Heavy, 6⅞d. to 7⅛d. per gall. Middle oil, 6½d. to 6¾d. per gall. Standard specification, 5⅞d. to 5⅞d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent 90/160, 1s. 1½d. to 1s. 2½d. per gall. Solvent 95/160, 1s. 2d. to 1s. 7d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE, CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £5 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 37s. 6d. to 42s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. 6d. per gall. 90/180, 2s. 3d. to 4s. per gal. Heavy, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100 %.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 10d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 3d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£2 16s. 10d. to £3 10s. per ton, according to quality.

CADMIUM SULPHIDE.—5s. to 6s. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity. drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—4⅞d. to 5⅞d. per lb.

LAMP BLACK.—£32 10s. per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. 10d. to 7s. per lb.

ZINC SULPHUR.—11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 5d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—2s. 4d. to 2s. 9d. per lb.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. 10½d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 6d. to 1s. 9d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—7s. 9d. to 8s. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. to 3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. per lb.
BISMUTH CITRATE.—9s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 9d. per lb.
BISMUTH SUBNITRATE.—8s. 3d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.
BISMUTH OXIDE.—12s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. o½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts., 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—B.P., 1s. 3d. to 1s. 4d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. 0d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—37s. per cwt., in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 6d. to 4s. 9d. per lb.
HEXAMINE.—1s. 11d. to 2s. 2d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 3d. per lb., for 28 lb. lots; potassium, 3s. 7d. per lb.; sodium, 3s. 6d. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 8d. to 2s. 11d. per lb. Green, 3s. 3d. to 3s. 4d. per lb.; U.S.P., 2s. 9d. to 3s. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 23s. 6d. per lb. net; Synthetic, 11s. to 13s. per lb.; Synthetic detached crystals, 11s. to 16s. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph., B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 6d. per lb.
METHYL SULPHONAL.—8s. 9d. to 9s. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 5d. to 2s. 8d. per lb.
PHENAZONE.—3s. 9d. to 4s. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—96s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 8d. to 2s. 9d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 3d. to 2s. 6d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911—2s. 5d. to 2s. 6d. per lb., B.P.C. 1923—2s. 8d. to 2s. 9d. per lb. U.S.P., 2s. 6d. to 2s. 9d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 6½d. to 1s. 7d. per lb. Crystal, 1s. 7d. to 1s. 8d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 6d. to 6s. 9d. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—6s. 6d. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL—1s. 10d. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 10d. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 3d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—8s. 6d. per lb.
CITRONELLOL.—13s. per lb.
CITRAL.—8s. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—10s. 6d. per lb.
GERANIOL (PALMAROSA).—20s. per lb.
GERANIOL.—6s. 6d. to 11s. per lb.
HELIOTROPINE.—5s. per lb.
ISO EUGENOL.—16s. per lb.
LINALOL.—Ex Bois de Rose, 13s. per lb. Ex Shui Oil, 9s. 3d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 17s. 6d. per lb. Ex Shui Oil Linalol. 10s. 6d. per lb.
METHYL ANTHRANILATE.—8s. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—34s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 9d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—45s. per lb.
SAFROL.—1s. 5d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—24s. per lb.
BOURBON GERANIUM OIL.—22s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. per lb.
CINNAMON OIL LEAF.—6s. 6d. per oz.
CASSIA OIL, 80/85%.—7s. per lb.
CITRONELLA OIL.—Java, 2s. 2d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 11d. per lb.
CLOVE OIL (PURE 90/92%).—8s. 9d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—2s. per lb.
LAVENDER OIL.—Mont Blanc, 48/50%, Esters, 16s. 3d. per lb.
LEMON OIL.—16s. 6d. per lb.
LEMONGRASS OIL.—4s. per lb.
ORANGE OIL, SWEET.—20s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—12s. 6d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. 9d. per lb.; Japanese, 9s. per lb.
PETITGRAIN.—8s. per lb. Sandalwood, Mysore, 28s. per lb. 95% 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing the e firms' independent and impartial opinions.*

November 29, 1928.

BUSINESS generally has been fair and prices, with very few exceptions, maintain a firm position. In many cases forward quotations are on a somewhat higher level, which will tend to cause an increase here when present stocks are worked out. Export inquiry is broadening and a fair volume of business has been placed.

General Chemicals

ACETONE continues in brisk demand at firm rates of £75 to £77 10s., according to quantity. It is understood synthetic material will again be liable for Key Industry Duty as and from January 1, 1929, which will probably cause market to remain firm.

ACID ACETIC has been in fair request with prices unchanged.

ACID FORMIC.—Demand has not been quite so active. Price holds firm at £44 to £45 for 85%.

ACID OXALIC has been been in active request at unchanged prices of about £30 10s. to £32 10s.

ACID LACTIC.—Demand is quite good and price continues firm at £43 per ton for 50% by weight.

ACID TARTARIC.—Although demand is rather slow price holds firm at 1s. 4½d. to 1s. 4¾d. and supplies are on short side.

AMMONIUM CHLORIDE.—Only a small business is passing at about £19 per ton for fine white crystals.

ALUMINA SULPHATE.—Prices have been advanced considerably and demand is active. Present prices about £7 10s. to £8 with little material offering.

BARIUM CHLORIDE.—This market continues strong and further advances are reported. Makers appear to be sold out for the early months of the New Year. Spot supplies command a premium and nominal price is £11.

COPPER SULPHATE.—Active and price higher owing to continual firmness of metal. Early delivery from some works cannot be obtained. Price about £26 for first-class brands.

CREAM OF TARTAR.—Demand is rather slack and price is steady at about £97 10s. less 2½% for best brands.

FORMALDEHYDE.—Demand is broadening and prices are inclined to be firm. Present prices about £39.

LEAD ACETATE.—Quite a fair business is passing at £42 for white, with brown £1 per ton less. Prices are firm.

LEAD NITRATE.—Firm at £36 10s. to £37.

LIME ACETATE.—Grey quality continues in short supply and price is firm.

METHYL ACETONE.—Active demand at firm prices of £57 to £60. Higher prices are not unlikely in the near future.

POTASSIUM CARBONATE AND CAUSTIC.—A small trade is passing at unchanged rates.

POTASSIUM CHLORATE.—Good demand at about £28 for spot supplies.

POTASSIUM PERMANGANATE.—A fair inquiry is being received with B.P. quality quoted at 5¼d. to 5½d. per lb.

POTASSIUM PRUSSIATE.—Quite a brisk trade is passing at £63 10s. to £65 10s., according to quantity. Market is firm.

SODIUM ACETATE.—Continues in short supply for early delivery. Inquiry is brisk and price holds firm at £21 10s. to £22 10s.

SODIUM HYPOSULPHITE.—British makers' prices for New Year unchanged. Demand for both commercial and photographic slow.

SODIUM PRUSSIATE.—Business is good in this product with price firm at 4¾d. to 5¼d. per lb.

SODIUM SULPHIDE.—British makers' prices for New Year unchanged. The product is only moving in small lots.

TARTAR EMETIC.—A steady trade is passing at 10¾d. per lb.

ZINC SULPHATE.—Demand is active and price remains firm at £12 to £13 for best brands.

Coal Tar Products

The coal tar product market is quieter. Benzols and naphthas are scarce, and there is little buying or selling being done in the other products.

MOTOR BENZOL is still scarce, and quantities have been sold at 1s. 7½d. per gallon f.o.r. makers' works.

SOLVENT NAPHTHA remains firm at 1s. 2¼d. per gallon, on rails, with only small quantities offering.

HEAVY NAPHTHA is unchanged at 1s. 1d. to 1s. 1½d. per gallon, on rails.

CREOSOTE OIL remains unchanged, at 5¼d. per gallon, on rails, in the North, to the end of the year, and at 6d. per gallon in London.

CRESYLIC ACID remains very weak, the 98/100% quality being quoted at about 2s. 2d. per gallon f.o.b., and the dark quality 95/97%, at 1s. 10d. per gallon, f.o.b. naked.

NAPHTHALENE remains firm, at £5 per ton for the 74/76 quality, and £6 to £6 10s. per ton for the 76/78 quality.

PITCH is quiet. To-day's value is about 40s. per ton, f.o.b. U.K. port.

Nitrogen Products

Sulphate of Ammonia.—A steady demand continues from most of the principal markets, and the price remains firm at about £9 14s. to £9 18s. per ton f.o.b. U.K. port in single bags. Home sales continue to be small. In view of the increased prices for December delivery, there has been a little end-month buying.

Nitrate of Soda.—Good sales continue to be made at scale prices in Europe and Egypt. In the United States there has been a slight advance in re-sale prices.

Reduced Fertiliser Railway Rates

WITH reference to the rebates in railway carriage on fertilisers which have been announced, Nitram, Ltd., understand that these will apply to all consignments forwarded by rail on or after December 1. They estimate that the saving will amount, on an average, to 1s. per ton on those fertilisers which are sold on carriage paid terms, viz., sulphate of ammonia and nitro-chalk, and it is their intention to credit this to consumers. A reduction for saving in carriage will accordingly be made on invoices for all parcels forwarded by rail on or after December 1, which reduction should be passed on to the ultimate buyers.

Latest Oil Prices

LONDON, November 28.—LINSEED OIL was flat and 2s. 6d. to 7s. 6d. per ton lower. Spot, ex mill, £30, December, £29; January-April and May-August, £28 15s.; and September-December, £29, naked. RAPE OIL was inactive. Crude extracted, £40 10s.; technical refined, £42 10s., naked, ex wharf. COTTON OIL was steady. Egyptian crude, £30 10s.; refined common edible, £36; deodorised, £38 per ton, naked, ex mill. TURPENTINE was inactive and 3d. per cwt. lower. American, spot, 48s. 9d.; December, 49s.; and January-April, 49s. 6d. per cwt.

HULL, November 28.—LINSEED OIL.—Spot to December, £29 7s. 6d.; January-April and May-August, £29 per ton, naked. COTTON OIL.—Egyptian crude (new) and December-February, £29 15s.; edible refined, spot and December-February, £33 10s.; technical, spot, £33; deodorised, spot, £35 10s. per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., spot, £37 15s. per ton, naked. GROUNDNUT OIL.—Crushed/extracted, £37 10s.; deodorised £37 10s. per ton. SOYA OIL.—Extracted and crushed, £33; deodorised, £36 10s. RAPE OIL.—Crude/extracted, £40 15s.; refined, £42 15s. per ton. TURPENTINE.—Spot, 51s. per cwt. COD OIL.—Spot, 30s. 3d. per cwt., barrels, net cash terms, ex mill. CASTOR OIL unaltered.

South Wales By-Products

THE slightly better tendency in South Wales by-product activities is being maintained. Transactions in most products are slightly better and values generally are firm. Pitch has a fairly good call round about 38s. to 42s. 6d. per ton, prompt delivery. Crude tar continues firm round about 50s. per ton, maker's works, and has a steady, moderate demand. Whizzed and crude naphthalene are slightly better, the former at 100s. per ton and crude round 80s. to 85s. per ton. Refined tars have a moderately good demand with values unchanged, gasworks tar changing hands round about 6¼d. to 7d. per gallon delivered, and coke oven tar at from 7d. to 7¾d. per gallon delivered. Patent fuel and coke exports declined sharply during the week, but this was due mainly to the boisterous weather. Prices are unchanged. Oil imports over the last four ascertainable weeks amounted to 12,556,694 gallons, a substantial decrease upon previous periods this year.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, November 28, 1928.

THE improvement advised last week has been fairly well maintained, and the relation of actual business to inquiry has been good.

Industrial Chemicals

ACETONE, B.G.S.—Nominally £74 10s. to £77 10s. per ton, ex wharf, according to quantity, but very little available for immediate delivery.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In rather good demand and now quoted 6¾d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Now offered at 2s. 6½d. per lb., less 5%, ex wharf, prompt shipment from the Continent.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf. Offered for prompt shipment at 1s. 4d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—On offer at £5 10s. per ton, c.i.f. U.K. ports. Spot material quoted £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 7s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Crystal meal quoted £8 10s. per ton, ex store.

AMMONIA, ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA, LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals, offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE, 98/100%.—On offer for prompt shipment from China at £39 10s. per ton, ex wharf.

ARSENIC, WHITE POWDERED.—Quoted £18 10s. per ton, ex wharf, prompt dispatch from mines. Spot material on offer at £19 15s. per ton, ex store.

BARIUM CHLORIDE.—Quoted £9 15s. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Spot material on offer at £11 per ton, ex wharf.

BLEACHING POWDER.—British manufacturer's contract price to consumers £6 12s. 6d. per ton, delivered minimum 4-ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price, £4 5s. to £4 15s. per ton, according to quality and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Still in good demand and price about £25 per ton, ex wharf.

FORMALDEHYDE, 40%.—Firmer. Offered for prompt shipment, c.i.f. U.K. ports at £37 per ton. Spot material quoted £38 10s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—On offer at £29 10s. per ton, ex store.

LEAD, WHITE.—Quoted £37 per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 per ton, ex store. Brown on offer at about £31 10s. per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½%, delivered.

POTASSIUM BICHROMATE.—4⅛d. per lb., delivered, minimum 4-ton lots. Under 4-ton lots ⅛d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Offered from the Continent at £25 per ton, c.i.f. U.K. ports. Spot material available at £26 per ton, ex store.

POTASSIUM CHLORATE, 99¾/100%, POWDER.—Quoted £22 15s. per ton, c.i.f. U.K. ports.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 6⅝d. per lb., ex store. Offered from the Continent at 6¼d. per lb., ex wharf, prompt shipment.

SODA, CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton, and 70/72%, £13 12s. 6d. per ton; minimum 4 ton lots carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—On offer for prompt delivery at about £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works minimum 4 ton lots. Under 4 and over 2 ton lots 1/16d. per lb. extra. Under 2 ton lots 3⅛d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay, minimum 4 ton lots with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4 ton lots. Prices for next year unchanged.

SODIUM NITRATE.—Quoted £10 4s. per ton, carriage paid buyer's station for ordinary quality. Refined quality 2s. 6d. per ton extra.

SODIUM PRUSSIATE.—Spot material on offer at 4⅞d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, 52s. 6d. per ton, delivered for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyers' works on contract, minimum 4 ton lots. Special prices for some consumers. Spot material 5s. per ton extra. Prices for next year unchanged.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Glass Technologists' Conference at Stourbridge

THE SOCIETY OF GLASS TECHNOLOGY held a two days' conference (Tuesday and Wednesday) last week at Stourbridge. Mr. Walter Butterworth, who presided, said although they had only existed eleven years, they had, by common consent, taken a place in the first rank of scientific societies, and their combined efforts had resulted in true scientific value for the advancement of the glass industry. Professor W. E. S. Turner (Sheffield), spoke on recent progress made in the study of refractory materials for the glass industry, and presented a memorandum on the purification of clay, heat treatment, and the use of sillimanite pots. He mentioned that a number of committees had been sitting for some time; but, although a fair amount of progress had been made, they could not pretend that finality was reached; indeed, he thought it would be a poor outlook for the glass industry and for refractories if a notion of finality was in their minds. A discussion followed relative to the chemical and physical characteristics of pots as used in the Stourbridge glass industry, and to various weaknesses which from time to time arose. In this discussion, pot manufacturers and glass pot users took part. Mr. Guy Evers mentioned that his firm are now carrying out an experiment under which glass house pots were being subjected in their kilns to a temperature of 1,400° C. before being allowed to cool down, preparatory to being forwarded to glass manufacturers.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, November 29, 1928.

On the whole, chemical traders on this market are meeting with a moderate amount of business, and although there has been little expansion in the size of individual parcels there seems to have been a shade more inquiry about for prompt transactions and also in respect of forward business, whilst specifications against contract commitments are moving fairly satisfactorily. With regard to the price situation, quotations are reasonably firm in all directions.

Heavy Chemicals

Sulphide of sodium is attracting no more than a quiet volume of business, but prices in this section are held at round £9 10s. per ton for the 60-65 per cent. solid material and £8 for the commercial. There is a moderate inquiry about for saltcake, offers of which are unchanged at £2 12s. 6d. per ton. Caustic soda is moving off in fair quantities at a firm range of prices, these varying from £13 7s. 6d. up to £15 7s. 6d. per ton, according to grade. A quiet trade is passing in the case of phosphate of soda, and values are fully maintained at round £12 10s. per ton. Chlorate of soda is in comparatively limited demand at the moment, and quotations are on the easy side at round 2¾d. per lb. Bichromate of soda is steady, and meets with a fair amount of inquiry at about 3⅛d. per lb. There is no change in the position of bicarbonate of soda, and moderate sales are being made at £10 10s. per ton. The demand for hyposulphite of soda is not too active, but prices are about maintained at £15 5s. per ton for the photographic material and £9 for the commercial. Prussiate of soda is steady at from 4½d. to 5½d. per lb., according to quantity, and a fair amount of interest is being shown. Alkali meets with a quietly steady demand, and offers of this material continue on a contract basis of £6 2s. 6d. per ton. Bleaching powder is relatively slow, with quotations ranging from about £6 15s. up to £7 per ton.

Bichromate of potash is well held at 4d. per lb., and inquiry this week has been about up to its recent level. Only a quiet business is going through in the case of permanganate of potash, but offers of this material keep steady at 5d. per lb. for the commercial kind and 5¼d. for the B.P. quality. There is a quiet demand about for chlorate of potash, prices of which are in the neighbourhood of 2¾d. per lb. With regard to yellow prussiate of potash, this is well held at 6¾d. to 7¼d. per lb., and sales are on a fair scale. Caustic potash is in moderately active request at from £33 5s. per ton for prompt delivery of one to five-ton lots. Carbonate of potash continues to display signs of firmness, current offers of this being at about £26 10s. per ton.

Sulphate of copper remains strong again at from £26 10s. per ton, f.o.b., and a satisfactory trade is being done in this section. Arsenic is in moderate request and there has been little alteration in values, these ranging from about £16 10s. to £17 per ton at the mines, for white powdered, Cornish makes. Nitrate of lead is only in limited demand, with quotations at £34 10s. per ton. Acetate of lead is also comparatively slow, with brown obtainable at round £38 10s. per ton and white at £39 10s. Offers of the acetates of lime are not too plentiful and prices are firm in consequence, with grey material at £16 10s. per ton and brown at £9.

Acids and Tar Products

Tartaric acid is fairly steady at from 1s. 4d. to 1s. 4¼d. per lb., and a moderate weight of business is going through. With regard to citric acid, round 2s. 6d. per lb. continues to be quoted for any small spot lots available. Oxalic acid shows little change on the week, but the demand for this is rather slow at 3¼d. per lb. Acetic acid is steady and in fair demand at about £67 per ton for the glacial and £36 for the 80 per cent. commercial. There has been no appreciable improvement in the demand for pitch, which is a shade weaker than before at £1 16s. fo.b. Creosote oil is on the quiet side, and down to about 5½d. per gallon, naked, is now being quoted. Crude carbolic acid is quoted at 1s. 11d. per gallon for 60's, with crystals firm and in fair request at 6¼d. per lb. Solvent naphtha is steady at round 1s. 1½d. per gallon, and a moderate demand is reported.

A Canadian-American Tour Film

There was a good attendance on Wednesday evening, at an informal meeting of the London Section of the Society of Chemical Industry, in Burlington House, to see a film of the recent Canadian-American tour, prepared by Mr. J. M. Leonard. Mr. W. J. A. Butterfield presided. The film, which occupied about an hour and a quarter, made an extremely interesting and representative pictorial record of the whole tour, from the departure from Southampton to the return to Liverpool. Particularly good were the sea pictures, the glimpses of Canadian river and woodland scenery, the remarkable reproductions of the carbide furnaces at Shawinigan, the views of Niagara taken from the aeroplane that went to the relief of the German airmen, the pictures of the Washington national memorials, the street and harbour scenes at New York, and the departure of the tourists, with a crowd of their American hosts on the quay waving good-byes.

On the conclusion of the film, the Chairman remarked that though he was not a member he felt after the vivid pictures shown as if he had been one of the party. In proposing a vote of thanks to Mr. Leonard, Mr. F. H. Carr said that what they had seen had recalled, as the best of memories could not quite do, memories of a delightful tour and of numbers of delightful people. Although on the industrial and technical side their visit was of great practical value, the chief benefit lay in the personal friendships formed, which helped to a better understanding between the British and American people. Dr. Colgate, in seconding, said the fact that that was the third reunion since the party's return indicated the happiness that the members had derived from the tour, and the pleasant place it occupied in their memories. Such tours were of great advantage from every point of view, and he hoped it would not be the last. Mr. F. E. Hamer, at the request of the Chairman, added a few words, emphasising the importance of Anglo-American friendship in the interests of world peace and civilization generally. Mr. Leonard, in acknowledging the vote, stated that it was the first film he had ever attempted and their appreciation would tempt him to undertake more work in that line.

Motor Fuel Proprietary Annual Meeting

The annual general meeting of Motor Fuel Proprietary was held on Tuesday, Colonel W. R. Howell presiding. He said that at their works at Slough, which were now operating successfully, their aim was to extract the maximum amount of petroleum products from the coal compatible with leaving an entirely satisfactory marketable fuel. He believed that theirs was the only system working in England which produced petroleum oil and smokeless fuel and left no surplus gas. As a matter of fact, surplus gas was the bugbear of many systems, as the value of the gas at any time appeared to be very doubtful. Gas works did not care for it, owing to the calorific value being higher than that which they made, and, where it was lower it reduced the manufactured article to water gas. A contract had been completed with the Meiros Collieries in South Wales for the erection of plant to deal with 500 tons of coal per day. A contract was also being negotiated for the erection of similar plant in the Nottinghamshire coal fields, while negotiations were also in progress for erecting units of their plant north of the Tweed. Dr. Paul Dvorkovitz (managing director and technologist), having reviewed the operations of the company from the technical side during the year, said that from the results they had achieved it would be seen that their company was well established as a pioneer in the coming great industry of low-temperature carbonisation. The general progress of carbonisation had been retarded by the fact that the coal industry was an extremely conservative one.

International Nickel Co. Developments

Holders of preferred and common stock of the International Nickel Co. are notified that the committee named in the deposit agreement of October 30, 1928, advises that it is assured that by November 30, 1928, a large majority of both preferred and common stock would have been deposited for exchange for preferred and common stock of the International Nickel Co. of Canada, pursuant to the plan outlined in the company's letter of October 30 to stockholders. It is contemplated that the plan will be declared operative not later than December 3.

Company News

N. V. Margarine Unie.—A half-yearly dividend on the 7 per cent. cumulative preference shares has been declared payable on and after December 1, 1928.

Dorman, Long and Co.—The annual report shows a profit of £353,207 for the past year, which, with a balance of £2,107 brought forward from last year, makes a total of £355,315. No dividend has been paid on the ordinary shares since the 5 per cent. for 1920–21, while the last distribution on the preferred ordinary was 8 per cent. for 1923–24.

J. and J. Cunningham.—After providing £8,408 for depreciation, and making provision for bad and doubtful debts, the balance at credit of profit and loss account for the year to June 30, including the balance brought in, is £63,214. A final dividend of 2½ per cent. on the ordinary shares is recommended, making 10 per cent., less tax, for the year, and £32,214 is to be carried forward. There has been a capital expenditure during the year of £3,209.

Lawes' Chemical Manure Co.—The annual meeting will be held at the Great Eastern Hotel, London, on December 6, at 12 noon. The report for the year states that the balance of profit and loss account, together with the amount brought forward, amounts to £7,813. Under the present conditions, the directors have deemed it advisable to place £5,000 of this to a reserve for contingencies, which leaves a balance of £2,813, which they recommend be carried forward.

Santa Catalina Nitrate Co.—A gross profit of £4,070 is shown for the year ended June 30, 1928. After deducting £1,736 for London expenses, £135 for Chilean income tax, and £523 for legal charges, there remains £1,675, to which is added the balance brought forward of £289, making together £1,964. By retransferring from reserve account £4,200, there is available £6,164, which permits of the writing off of stoppage of works expenses, £5,089, leaving to be carried forward £1,075.

Tate and Lyle.—After placing £150,000 to general reserve, £50,000 to depreciation reserve, £60,000 to investment reserve and leaving the dividend reserve untouched, the directors propose to recommend to the shareholders at the annual general meeting, to be held on December 5, a final dividend on the ordinary shares of 8 per cent., which, together with the interim dividend of 4 per cent. paid in June last, makes a total for the year of 12 per cent., subject to deduction of income tax, and to carry forward £41,135 to next year.

Broken Hill South.—The report for the year ended June 30, 1928, submitted in Melbourne on October 22, states that the net profit for the past year was £208,362. Dividends Nos. 23/26 absorbed £180,000, appropriation for debenture sinking fund £13,333, and appropriation for plant and development £140,000, leaving balance to the appropriation account of £121,529. After closing the year's accounts, dividend No. 27, of 1s. per share (£40,000) was paid on August 15, 1928. The gross profit shown in the working account amounted to £183,334, of which £19,908 was referable to the production of previous periods.

Leeds Fireclay Co., Ltd.—For the year to June 30 last the report states that the profit is £73,679 (as compared with £42,887 last year), to which is to be added £7,364 brought forward, making £81,043. After providing for debenture and loan interest, £10,438, there remains £70,606. The 12½ per cent. dividend on preference shares, against 8 per cent. last year, and the 10½ per cent. dividend on ordinary shares, against 6 per cent. last year, absorb £60,500, and there is to carry forward £10,106. The reserve fund has been increased from £128,135 on June 30, 1927, to £172,500 on June 30, 1928. Last year £1,864 was placed to the reserve.

British Cotton and Wool Dyers Co.—The profits for the half-year ended September 30, 1928, including income from investments, etc., after charging administration expenses, £2,516 for specific depreciation, and £27,613 for repairs and renewals, and providing an estimated amount in respect of income tax, and other contingencies, amount to £68,289. From this have to be deducted for audit fees and other professional charges £815, interest on first mortgage debenture stock to September 30, 1928, £12,400, debenture holders' trustees £100, amount transferred to depreciation fund of £12,500 (which now stands at £327,500), showing a profit for the period of £42,474; after adding the amount brought forward, £21,427, there is a credit balance on the profit and loss account of £63,901.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks, and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to December 28, 1928.

Planocaine.

496,218. Class 3. Chemical substances prepared for use in medicine and pharmacy. May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11; manufacturers.—October 22, 1928.

Blundolene.

496,361. Class 1. Chemical substances used in manufactures, photography, or philosophical research and anti-corrosives. Blundell, Spence and Co., Ltd., 9, Upper Thames Street, London, E.C.4.; and Beverley Road, Hull; paint, colour, oil and varnish manufacturers.—October 26, 1928.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

Crushing and Drying Machines.—A Turkish firm is desirous of purchasing machines for crushing and drying valonea acorns. (Ref. A.X. 7166.)

Pinchin Johnson Acquisitions

Pinchin, Johnson and Co., Ltd., have completed the acquisition of the businesses of Borthwick Proprietary, Ltd., Sydney, Australia, and the Victoria Varnish Co., Ltd., of Melbourne. Further, the directors have recently completed the purchase of 75 per cent. of the share capital of the Shalimar Paint, Varnish and Colour Co., Ltd., of Calcutta, and they now propose to increase the capital for the purpose of acquiring the whole of the issued share capital of Robert Ingham Clark and Co., Ltd., and the undertakings of Robert Kearsley and Co., Ltd., Tabor Trego and Co., Ltd., and R. Gay and Co., Ltd. The directors feel that these acquisitions will add very materially to the strength of the organisation, and should ensure a substantial addition to the earning power of the company. Through the medium of the various extensions indicated, the company will possess important manufacturing and sales facilities in Australia, India, United States of America and the leading countries on the Continent. The directors consider these extensions should in every way consolidate and improve the prospects of the whole organisation. The plan is to increase the capital to £1,493,843 by the creation of 143,843 new ordinary shares of £1 each, ranking in all respects *pari passu* with the existing 850,000 ordinary shares of £1 each in the company. Another resolution to be submitted at the meeting, which is called for December 5, at the Hotel Cecil, London, is: "That the capital be further increased to £2,000,000 by the creation of 506,157 new ordinary shares of £1 each, ranking in all respects *pari passu* with the said existing ordinary shares of £1 each in the company."

Transparent Paper: A New Process

Transparent Paper, Ltd., has, after protracted negotiations, acquired a new and valuable process for making transparent paper, distinct from their present viscose method. Under the guidance of Dr. Albert Mond, specimens of the product have already been shown, and these reveal that it has been possible to obtain exceptional colour effects, as well as tones of gold and silver. This additional process consolidates the monopoly of Transparent Paper, Ltd., and enables the company, with its present resources at the Bury (Lancs) works to cover all classes of transparent paper.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

NITRO-CELLULOSE EXPLOSIVES CO., LTD., London, W.C. (M., 1/12/28.) Registered November 14, £500 debentures, part of £12,500; general charge.

STAPLETON (P.), LTD., Mountsorrel, dyers, bleachers, etc. (M., 1/12/28.) Registered November 10, charge to bank; charged on properties in Cossington Road, Sileby. *Nil. January 26, 1928.

Satisfactions

AUSTINS, LTD., London, S.E., manufacturing chemists. (M.S., 1/12/28.) Satisfaction registered November 19, £600, registered December 23, 1910.

SALAMON AND CO., Rainham, Essex, chemical manufacturers. (M.S., 1/12/28.) Satisfaction registered November 14, £40,000, registered February 12, 1924.

New Companies Registered

AMOA CHEMICAL CO., LTD., 46, Cannon Street, London, E.C.4. Registered November 26. Nom. capital, £25,000 in 20,000 8 per cent. cumulative participating preferece shares of 10s. each and 60,000 8 per cent. deferred ordinary shares of 5s. each. To adopt an agreement with R. Macpherson and W. E. Billinghame, to acquire the business of the Amoa Chemical Co., and a licence to work, develop and turn to account certain patents, and a pending patent, to acquire the trade marks "Amoa," "Coldphalt," and "Mulphalt," and manufacture and deal in emulsifying agents, soluble oils (mineral, animal, and vegetable), bitumen, asphalt, tar, disinfectants, sheep dip, deodorants, pest sprays, tar and grease solvents, etc. Managing directors: R. Macpherson and W. E. Billinghame.

N.C.W. PAINT AND VARNISH REMOVER CO., LTD., 58, George Street, Edinburgh. Private company. Registered November 26 in Edinburgh. Nom. capital, £500 in £1 shares. Drysalters and chemists, refiners, manufacturers, etc. Directors: T. K. Bonar and T. K. Bonar, Jr.

PERINA TRADING CO., LTD. Registered November 24. Nom. capital, £2,000 in £1 shares. To acquire the business of merchant, shipper, manufacturer, and agent, carried on by S. A. Kinder, as the "Perina Trading Co.," at Preston and elsewhere, and to carry on in the United Kingdom, West Africa and elsewhere the said business, and that of dyers, printers, bleachers, designers, chemical and colour manufacturers and merchants, etc. Directors: S. A. Kinder, 20-21, Fox Street, Preston, Mrs. Mabel K. Kinder, Thos. Walkden.

SOUTH WALES RED OXIDE AND COLOUR CO., LTD. Registered November 24. Nom. capital, £2,000 in £1 shares. Manufacturers, importers, exporters of, and dealers in, red oxide of iron, colours, paints, varnishes, lacquers, etc. Directors: J. J. Mitchell, J.P. (permanent director and chairman), "Peverell," Swansea, and W. Wenham.

Huge Bed of Salt Found In Alberta

ACCORDING to an announcement made by the Minister of Railways and Telephones of Alberta, drilling operations carried out at Waterways, a point at the northern terminal of the Alberta and Great Waterways Railway, have revealed a large bed of salt. The salt was struck at the 670-ft. level, and as the drilling has now reached the 883-ft. level and is still encountering the salt deposit, it means that there is a solid vein at least 213 ft. in depth.

Chemical Merchants' Affairs: Summary of Statement

IN the bankruptcy of Sidney Herbert Travis (trading in co-partnership with another as S. H. Travis and Co., chemical merchants, 33, King's Road, St. Pancras, London), the official receiver has issued a summary of the joint statement, which shows liabilities of £11,733, of which £5,449 is returned as due to 176 unsecured creditors and £11,510 as expected to rank, and estimated net assets £2,262. This statement has been amended and shows ranking liabilities £3,492, contingent liabilities £4,196 to rank for only £1 4s., and assets £402. In his observations the official receiver reports that the receiving order was made on a creditor's petition. S. H. Travis was adjudged bankrupt on July 27. The application for an order of adjudication against R. W. Travis as a partner is adjourned until December 6, to afford an opportunity for lodging a proposal for a composition at an early date. It appears that the partnership firm of S. H. Travis, R. W. Travis, and W. W. Storer commenced business on July 1, 1919. R. W. Travis took no active part in the business. W. W. Storer resigned from partnership in 1923, when there was a deficiency on his capital account of £7,283, one half of which was transferred to the debit of the capital accounts of each of the remaining partners. In the trading period 1920-25 there was a loss of £7,889 0s. 6d. owing to the fraud of an agent, and a loss estimated at £9,600 by reason of an arrangement under which the firm supplied raw materials to a manufacturer for making up drugs into medicines. In March 1928, S. H. Travis was offered certain drugs and instruments by an agent. He borrowed £1,000 from a relative and purchased the goods on the understanding that the agent would arrange their sale at a profit. The agent was employed until March, 1927, when he was informed that his services were no longer required, whereupon he commenced proceedings against S. H. Travis, claiming a declaration of partnership and damages. As a result of the action the declaration sought for was granted, but no damages were awarded, and Travis was appointed sole receiver of the partnership property, the Order of the Court being varied in July, 1928, when he and the agent were appointed joint receivers. Partnership failure and insolvency is attributed to failure of the arrangement referred to, and law costs, and stoppage of work after the receivership action. At a meeting of creditors in July, 1928, Mr. P. S. Booth was appointed trustee of the estate. S. H. Travis has lodged a statement of his separate affairs, disclosing no assets, and liabilities of £124 2s. 9d. R. W. Travis has not yet lodged a statement of his separate affairs.